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"The Romance of the Telephone:" Women, Disability, and Technology in Nineteenth- and Early Twentieth-Century Literature"

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“The Romance of the Telephone:” Women, Disability, and Technology in Nineteenth- and Early Twentieth-Century Literature

by

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Dedication

For my mother and grandfather, Susan and Bruce Frye

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edited, encouraged—a true example of reciprocity, generosity, and love. All that is left is to welcome our son into the world.

Abstract

"The Romance of the Telephone:" Women, Disability, and Technology in Nineteenth- and Early Twentieth-Century Literature

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This project traces the literary and cultural history of the telephone and takes into account its complex origin points in sonic theory, oralism, and the intersection of deafness and femininity. The telephone's origin story, summarized as what I term the "Romance of the Telephone," situates it as a direct descendent of hearing assistive technologies designed for deaf people, in particular deaf women. As such, I examine how the telephone, as technological object and a cultural symbol, emerged out of nineteenth- and early twentieth-century literary and sociocultural narratives focused on disability and gender. Prior to the manifestation of the telephone in 1876, emergent sonic theories fueled the literary experiments of nineteenth and early twentieth-century women authors, particularly in terms of their representation of women's sonic mediation. From deafness to super-hearing, the spectrum of women's aurality became a literary testing ground in which authors could explore the possibilities and limitations of sound and sonic perception.

By examining novels by Charlotte Brontë and George Eliot, the oralist and eugenic writing of Alexander Graham Bell, and recovered texts by Florence McLandburgh and Elizabeth Stuart Phelps, my dissertation tracks the literary and cultural evolution of women's aurality in relation to 19th century communication technology, specifically the telephone. My first chapter reads *Jane Eyre* (1848) and *The Mill on the Floss* (1860) collectively as speculative fiction, arguing that both

Brontë and Eliot used the figure of the female sonic mediator in order to develop and anticipate technological and ideological breakthroughs in sonic theory. My second chapter focuses on the narratives of invention that surround Alexander Graham Bell's development of the Bell Telephone System, using the concept of crip temporality to reveal the presence of the telephone's deaf ancestry. My third and final chapter reads two recovered short stories, McLandburgh's "The Automaton Ear" (1873) and Phelps's "The Chief Operator" (1909) in order to argue that the interconnected figures of the deaf woman and the telephone operator persist as representational embodiments of this technology's functionality and accessibility.

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"The Romance of the Telephone:" Women, Disability, and Technology in Nineteenth- and Early Twentieth-Century Literature

Introduction

I borrow the title of this dissertation, "The Romance of the Telephone," from Fred de Land's *Dumb No Longer: A Romance of the Telephone* (1908).[1] I picked up a first edition of this book at the library during the early stages of my research into the history of the telephone, simultaneously disgusted and excited by its title. I discovered quickly that this book has very little telephone history and—more dissatisfyingly—even less romance. This book is, in fact, a propaganda text, designed to sing the praises of oralist education by reprising a popular, largely forgotten narrative: the story that Alexander Graham Bell invented the telephone as a cure for his wife's, Mabel Hubbard's, deafness. It concerns itself mostly with chronicling the "success" of otherwise pathetic d/Deaf people, like Mabel Hubbard herself, who had the good fortune to be educated by heroic, oralist teachers. It demonizes Deaf sign language culture in the crudest of terms.

As a Hard of Hearing (HoH) person whose entire childhood education—including my access to disability accommodation—was in some sense determined by these persistent attitudes, this book was my nightmare—a true return of the repressed. Lured in by the idea of a telephone romance, I found instead a revolting piece of my own history that I had never wanted to examine.

The history I initially set out to recover was the link between assistive technology, like my own hearing aids, and the telephone, which had become newly accessible to me in my young

[1] Washington, D.C.: Volta Bureau, 1908.

adult life. Like me, generations of HoH and d/Deaf people have had recently an entirely different relationship with telephony than they did as children, if they have access to smartphones with texting, video chat, and internet capabilities. This relatively new telephone accessibility made me curious about the connections between two technologies I had always seen as inherently related—my hearing aids and computers.

As a small child, I spent a few formative years in Palo Alto, California, living with my mother and her partner, an electrical engineer specializing in memory chips for a company called Rambus. This was in the early 90s—when developments in miniaturization had begun to accelerate, and when there was intense competition to make computers with large amounts of memory come out in small packages. It was also when I received my first hearing aid for my left ear.

My first hearing aid was transparent—in a clear plastic casing which showcased the tiny green components that lay inside. It balanced precariously on my four-year-old ear, a little bit too big for a child, and limited by the miniaturization capabilities of that time. I received a light-up mermaid doll as a reward for learning to put it in by myself. The transparent hearing aid was the first object I possessed that wasn't exactly a toy, and I felt deeply attached to it; most likely because its clear case and green components made it seem part of the household, which was always scattered with the fragmented pieces of motherboards and RAM. I remember carefully taking off my hearing aid and laying it on top a motherboard I had been given as a toy, pretending that it, too, was a component of a magic computer I was building.

This technological play existed in stark contrast to the work I was doing, even as a child, to become fully integrated into the hearing world. All of my education centered around oralism, a method of deaf education that was popularized in the mid nineteenth-century and which

became the norm by the early twentieth-century, emphasizing speech and lip-reading over any form of sign language. Oralist teachers, even now, view American Sign Language (ASL) as a threat to children's linguistic and intellectual development. Like the vast majority of HoH and d/Deaf child born to hearing parents during this time period and earlier, the school system mainstreamed me into a classroom primarily designed for abled-bodied and hearing children, the main oralist practice for enforcing cultural and linguistic assimilation. To state it directly, the lasting harm these practices created, for myself and for generations of other HoH and d/Deaf people born in the U.S. in the twentieth century, cannot be quantified. Even adults like myself who now pass completely for hearing, the highest achievement within oralist education, often remain with the impression that we are alone in our disabled experience, that we should not draw attention to our disability by asking for any form of further accommodation, and that we have no place either in hearing culture or in Deaf culture. Oralism has caused isolation, disenfranchisement, and acute cases of internalized ableism in millions of children and adults.

In writing my own version of "The Romance of the Telephone," I found myself in the uncomfortable position of acknowledging that oralism—with all of its lingering, damaging effects—was always intertwined with the technological magic I associate with my own hearing aids. It remains key element not only in the modern social construction of deafness, but also in the history and technoscience of the telephone. Just as I located a sense of disabled belonging, of familial affection and attachment in the electronic form of my prosthetics, I also had to acknowledge that their origin story was far from transparent or familiar. Their technological ancestry, and my own disabled ancestry, was also steeped in oralism and its partnership with eugenics.

The goal of my dissertation is to write a literary history of the telephone, the technological descendant of hearing assistive technology, that takes into account its complex origin points in sonic theory, oralism, and the intersection of deafness and femininity. In order to do so, I examine how the telephone, as technological object and a cultural symbol, emerged out of nineteenth- and early twentieth-century literary and sociocultural narratives focused on disability and gender. In the mid nineteenth century, a number of sound and communication technologies became available to the public. These technologies, ranging from the stethoscope to the telegram and culminating in the telephone, were the material outcomes of evolving and conflicting sonic theories. Prior to the manifestation of these technologies, these sonic theories fueled the literary experiments of nineteenth and early twentieth-century women authors, particularly in terms of their representation of women's sonic mediation. From deafness to super-hearing, the spectrum of women's aurality became a literary testing ground in which authors could explore the possibilities and limitations of sound and sonic perception.

By examining novels by Charlotte Brontë and George Eliot, the oralist and eugenic writing of Alexander Graham Bell, and recovered texts by Florence McLandburgh and Elizabeth Stuart Phelps, my dissertation tracks the literary and cultural evolution of women's aurality in relation to 19th century communication technology, specifically the telephone. Countering dominant historical perspectives that position the telephone as a monumental scientific innovation, invented by an equally monolithic, male inventor who is solely responsible for the invention,[2] I propose that the history of the telephone should illustrate an ongoing, collaborative

[2] See John Brook's *Telephone: The First Hundred Years*, New York: Harper & Row, 1976, and Walter Isaacson's *The Innovators: How a Group of Hackers, Geniuses, and Geeks Created the Digital Revolution*, New York: Simon and Schuster, 2014.

process. This process didn't involve a single inventor in a laboratory, but rather a foregrounded literary and cultural conversation about sonic theory and gender that exists in mid nineteenth-century texts, a conversation which resonates clearly with Alexander Graham Bell's involvement with the d/Deaf community and his marriage to a deaf woman, Mabel Hubbard Bell. I argue that these literary representations of women's aurality and sonic mediation, as well as the historical material documenting the telephone's invention, work to anticipate, develop, and reinterpret the telephone as I see it—as an evolving technology defined by its location at the intersection of disability and gender. Such an approach extracts the history of the telephone from foregone conclusions that have effectively excluded women and disabled people, particularly d/Deaf women like myself, who have not been able to see themselves in the technologies that they rely upon daily. We are not the lucky beneficiaries of hearing aids and smartphones—we are the rightful inheritors of these communicative technologies.

Terminology and Key Theoretical Concepts

The interdisciplinary nature of this project, which brings together interlinking combinations literary studies, media studies, disability/crip theory, and feminist studies, necessitates the use of specific theoretical terms which may be unfamiliar to some readers but which nonetheless are well-known in their respective fields. Because my project engages with Julie Avril Minich's proposal for "an approach to disability studies that emphasizes its mode of analysis rather than its objects of study,"[3] focusing not just on identifiable representations of disability in nineteenth-century literature but also on how disability itself operates as a way of knowing and a means of being, it is important to clarify what exactly I mean by disability.

[3] "Enabling Whom? Critical Disability Studies Now," *Lateral 5.1* (2016).

Throughout this dissertation I use the term "disability" to refer to a wide range of physical and mental differences as well as in its broader, theoretical sense. I approach disability from a crip theory perspective, relying on Carrie Sandahl's and Robert McRuer's development of crip theory as it intersects with queer theory, where the word "crip," short for crippled, has been reappropriated as collective identity in a similar way as the word "queer." Although referring originally to physically disabled activists, Sandahl notes that the category of crip identity "has expanded to include not only those with physical impairments but those with sensory or mental impairments as well."[4] I use this definition more expansively, not in terms of impairments but in terms of differences or alterities. McRuer argues for the inherent resistance and creativity of crip identity, where "crip experiences and epistemologies should be central to our efforts to counter neoliberalism and access alternative ways of being."[5] As I will argue, literary representations of disability often perform these same functions, albeit in their own cultural contexts. Furthermore, Alison Kafer expands upon these definitions and calls to action by stating that, in order to arrive a political, future-oriented vision of disability, we need to escape "the assumption that 'disabled' and 'nondisabled' are discrete, self-evident categories, choosing instead to explore the creation of such categories and the moments in which they fail to hold."[6] In my own decision to examine the modern construction of deafness alongside the development of the telephone, I consider the fact that the deaf/hearing spectrum, as well as disability in general, was constantly under

[4] "Queering the Crip or Cripping the Queer?: Intersections of Queer and Crip Identities in Solo Autobiographical Performance," *GLQ: A Journal of Lesbian and Gay Studies*, 9.1 (2003): 25-56, 27.
[5] *Crip Theory: Cultural Signs of Queerness and Disability*, New York: New York University Press, 2006, 41-42.
[6] *Feminist, Queer, Crip*, Bloomington: Indiana University Press, 2013, 10.

categorical re-negotiation. This project incorporates auralities that do not fall neatly on the deaf/hearing binary in order to examine how they anticipate and imagine more inclusive futures.

Often I find it necessary to distinguish between a broader understanding of disability and a more specific understanding of d/Deafness.[7] When examining nineteenth-century sources, it is difficult to articulate or describe categories of people who today would belong to modern Deaf community. This community defines itself along the lines of d/Deaf, and the distinction between little and big *D* has become litmus test for a nuanced understanding of who exactly belongs to the Deaf community. People working within Deaf studies both rely on and dispute the distinction between little *d* and big *D*, where the former refers to an audiological diagnosis and the later to cultural and linguistic identity. The fact that audiological and cultural realities of d/Deafness are not mutually exclusive— the physical condition of deafness is not always easily separable from cultural practice of Deafness— brings the d/D distinction into constant question. For example, it is as possible for a hearing person to be culturally Deaf, especially in the case of children of deaf adults (CODAs), as it is possible for a deaf person with a diagnosable "hearing loss" to be culturally hearing.[8] The majority of Deaf people (people who are culturally Deaf) possess both

[7] The interaction between disability and d/Deafness is deeply complex, as Alison Kafer and Susan Burch acknowledge in their introduction to *Deaf and Disability Studies: Interdisciplinary Perspectives* (2010). While there are obvious alliances between the d/Deaf community and the disabled community, in particular a common rejection of pathologized medical conditions and hearing loss, there are also points of conflict. As they point out, "Many deaf individuals have claimed that they are *not* disabled, identifying solely as members of a linguistic minority, thereby suggesting that there are not intersections between deaf and disability or deaf studies and disability studies" (xvii). Because disability studies has framed my own adult, deaf experience, not Deaf culture, I identify as disabled even more readily than Hard of Hearing.

[8] Even as I use the term "hearing loss" for the sake of familiarity, I also want to acknowledge the term "deaf gain" is a more inclusive way of thinking about this sensory difference. In "Reframing: From Hearing Loss to Deaf Gain," H-Dirksen Bauman and Joseph Murray explain how this turn of phrase came to be: "The first mention of Deaf Gain was by an Englishman named Aaron Williamson. Williamson, a performance artist gave a presentation to Dirksen Bauman's graduate class, Enforcing Normalcy: Deaf and Disability Studies in the spring of 2005,

the physical condition of deafness described in an audiogram, and the cultural experience of Deafness through sign language. A person who identifies as Deaf, associating that uppercase *D* with sign language communication and the Deaf cultural community, may also identify as deaf, and as having a "hearing loss" measurable by decibel. Most typical in my own experience as a little *d* deaf person, however, are people who resist one category, either because they are deaf and communicate orally, without participating in the Deaf community, or because they are Deaf and choose to purposefully eschew the medical definition of disability and ally themselves with a sign language tradition and culture.

In the nineteenth century these categories of identity were equally tied to physical and linguistic difference, which Jennifer Esmail's *Reading Victorian Deafness* (2013) defines as "the dual nature of deafness: deaf people cannot hear and often sign instead of speak." The Victorian terms, then, "were first *deaf and dumb* and then *deaf-mute*."[9] These terms eliminated the potential inclusiveness of the word "deaf," which could be modified to become "a little deaf" or "deaf in one ear," both examples that defined a physical condition while implicitly leaving open the possibility of oral communication. "Deaf and dumb" and "deaf-mute" are designed to be unambiguous about how d/Deaf people were disabled—a "deaf and dumb" or "deaf-mute" person was identified by their inability to speak as much as their inability to hear. As Esmail points out, reconciling our modern terminology for d/Deafness with these 19th century terms is extremely difficult, leading her to make the decision to characterize her Victorian authors,

where he told of his experience of going deaf later in life. At the onset of his deafness, Williamson consulted many doctors, and they all told him the same thing: 'You're losing your hearing.' He wondered why it was that not a single doctor told him he was *gaining his deafness*." (*Deaf Studies Digital Journal*, 1 (2009): 3)

[9] *Reading Victorian Deafness: Signs and Sounds in Victorian Literature and Culture*, Athens: Ohio University Press, 2013, 10-11.

regardless of sign-language use or self-identification, as Deaf. This decision helps to unify the Victorian individual and authors who existed on a complex spectrum of hearing and deafness that may not otherwise be seen as belonging to the same category, solidifying Esmail's analysis of an entire oeuvre of 19th century Deaf literature. For my own purposes, however, perhaps because of the difficult work of identifying nineteenth-century d/Deaf literature has already been done so successfully, I choose to complicate this binary notion of who is d/Deaf during this literary and historical period.

I argue that broadly defining nineteenth-century d/Deafness as uppercase Deafness is simplifying a problem: many people who were d/Deaf during this time deliberately chose not to identify as such, distancing themselves from sign language communities.[10] To return them to these communities is problematic in that it erases the historic and stigmatized division between people on the spectrum of d/Deafness, between the Hard of Hearing and the profoundly d/Deaf. The onset of oralism and mainstreaming in the late nineteenth-century often pitted d/Deaf people on the opposing sides of the hearing/deaf spectrum against each other. Late d/Deafened people who would today be called Hard of Hearing, people for whom lipreading was possible, people who had enough hearing to effectively pass as completely hearing, were all deemed desirable d/Deaf citizens able to find a place—albeit often marginalized—in the hearing world. For example, two well-known d/Deaf women that I discuss briefly in this dissertation, Harriet Martineau and Mabel Hubbard Bell, often fought to distinguish themselves from sign language users, the "deaf and dumb" and "deaf-mutes," in order to gain access to the intellectual, economic, and familial spaces that would otherwise be denied to them.

[10] Esmail does clarify that Harriet Martineau, who disassociated from d/Deaf signing communities, would have identified as little *d* deaf had she lived in the twentieth century (63).

My analyses of disability and d/Deafness always exists alongside an analysis of gender, in particular femininity, and works together with an analysis of the interaction of all three of these categories. In order to characterize this interaction, I rely on the term "intersectionality," drawing from Kimberlé Crenshaw's original use of the term as an expression of legal and antiracist exigency, where "because the intersectional experience is greater than the sum of racism and sexism, any analysis that does not take intersectionality into account cannot sufficiently address the particular manner in which Black women are subordinated."[11] Intersectionality's origins in Black feminism are particularly meaningful and urgent in discussions that include race, but the term has also become an invaluable way of expressing the potential for inclusive discussions of a wide range of intersecting identities. As Sami Schalk specifies in her work on disability in Black women's speculative fiction, "intersectionality is used to reference major social identities that are created within systems of privilege and oppression, including race, class, gender, sexuality, (dis)ability, age, nationality, and ethnicity."[12] Particularly of interest to my project is the ways in which intersectionality functions in the context of speculative fiction as a genre, allowing authors to experiment with the "rules of reality," by which Schalk "mean[s] culturally and historically specific social narrative of the possibilities and meaning of body minds, time, space, and technology, as well as our constructed notions of what constitutes a 'real' disability, gender, race, and so on." Especially in the case of two canonical novels I discuss in this dissertation, *Jane Eyre* and *Mill on the Floss*, reading these texts as speculative fiction uncovers their investment in questioning these intersectional

[11] "Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics," *University of Chicago Legal Forum*, 1.8 (1989):140.
[12] *Bodyminds Reimagined: (Dis)ability, Race, and Gender in Black Women's Speculative Fiction*, Durham: Duke University Press, 2018, 7.

categories, these similar "rules of reality," in order to imagine a more inclusive or radical future for their heroines. I also see my project in conversation with the more specific genre of Afrofuturism, which Ytasha Womack locates at the "intersection of imagination, technology, the future, and [Black] liberation."[13] In my rewriting of the telephone's history, which aims to reclaim communication technology for the d/Deaf and disabled, I rely on the logic of Afrofuturism which has succeeded in reclaiming, for the African Diasporic community,[14] an imagined technological future by investigating these points of intersection.

I also want to attend to Schalk's point that intersectional identities operate both in "systems of privilege and oppression," since my own discussions of the nineteenth-century intersection of disability and gender, which almost always functions under assumed whiteness, reveal as much privilege as they do oppression. The intersection of d/Deafness and femininity operates under simultaneous systems of privilege and oppression, and is defined by a cultural association between women and communication. As I discuss frequently in this dissertation, women both real and imagined are placed at the center of communication systems—as conductors of their families' social circles, as authors and educators, as telephone operators, and as sonic mediators in general.[15] This positioning grants women a great deal of power and

[13] *Afrofuturism: The World of Black Sci-Fi and Fantasy Culture*, Chicago: Lawrence Hill Books, 2013, 9.

[14] I also want to acknowledge that these communities are not mutually exclusive—the d/Deaf community obviously intersects with Black communities and vice versa.

[15] Brenda Jo Brueggeman summarizes this gendered communication expectation: "as Bonnie Tucker points out in her controversial recent autobiography *The Feel of Silence,* men expect their female partners to carry out an array of social functions that demand precisely the kind of communicative competence that is challenging for the deaf. Women generally mediate between the home and the world in arranging the social obligations and daily domestic duties of (heterosexual) coupled and family life. This calls for speaking with many people, a high proportion of them strangers, both in person and by telephone." Brueggemann, Brenda Jo. "On (Almost) Passing." *College English,* vol. 59, no. 6, 1997, pp. 647–660, 653.

privilege while simultaneously upping the stakes—and potential pitfalls—for women whose communication abilities deviate from the norm. d/Deaf women are especially disenfranchised by this gendered expectation of communication, especially since professions that are predominantly female—teaching, office administration, nursing, retail, custodial work, and even mothering—are dependent on socially and technologically established methods of oral communication. As fictional representations, d/Deaf women often represent the imminent failure or creative misfiring of the communication system in which they are operating. On the flip side, women who are exceptionally talented oral communicators and listeners, including fictional women endowed with super-hearing, are substantially elevated within their social systems.

In order to express the full spectrum of women's d/Deafness and hearing, I use the term "women's aurality." The word "aural," which is defined first as "of or pertaining to the organ of hearing" and secondly as "received or perceived by the ear,"[16] can be used more neutrally than "hearing," which communicates a more concrete sense of sound reception, excluding the possibility of deafness. I use the concept of aurality in its most flexible sense, acknowledging that its connection to the human ear does not specify the accuracy, success, or definitive presence of hearing ability. A more inclusive and expansive term than women's hearing or women's listening, women's aurality does not project a specific, embodied experience other than having ears or existing in a sonic world. Examining women's aurality allows me to go beyond the deaf/hearing binary and to consider more inclusively the complexity of women's communicative experience, which includes a range of sonic perception from super-hearing to deafness.

[16] "aural, adj.2." *OED Online*. Oxford University Press, June 2020.

In nineteenth- and early twentieth-century texts, women's aurality often positions them at the center of communication networks. My discussion of women's aurality takes into account the fact that the influential media scholar Friedrich Kittler, in his discussion of the "Mother's Mouth" in *Discourse Networks 1800/1900*, interpreted women's orality, the act of speech, as an act of standardization. In contrast, women's aurality, the act of receiving sound or oral communication, often becomes an act of resistance and differentiation when it intersects with disability in nineteenth-century and early twentieth-century literature. I reinterpret Kittler's theory of "Mother's Mouth," where he argues that women—mothers specifically— were placed in charge of the oral communicative education of their children during the Romantic period, citing multiple primers and teaching manuals that reference the woman's mouth as an instrument, and as the educational standard for all oral communication.[17] Kittler focuses on orality rather than aurality, on women as standardizing speakers rather than as, more broadly, sonic mediators.[18] However, it is clear from my nineteenth-century and early-twentieth century sources that women's aurality, which includes both hearing and mishearing, partial and complete oral comprehension—all possible formulations of women's aurality—were as critically central to the anticipation of future communication technology as "the Mother's speech" was to the

[17] *Discourse Networks 1800/1900*, trans. Michael Metteer and Chris Cullens. Forward by David E. Wellbery. Stanford: Stanford University Press, 1990, 27-34.
[18] I use "sonic mediators" with Marshall McLuhan's understanding that mediation is not in and of itself only about the transmission of content or a message. Indeed, the embodiment or form that mediation takes—the medium or the mediator—determines the meaning of the actual content: "'the medium is the message' because it is the medium that shapes and controls the scale and form of human association and action" ("The Medium is the Message," in *Understanding Media: The Extensions of Man*, New York: McGraw Hill, 1964, 9).

standardization of oral language. In other words, the feminized, maternal ear is just as important to the development of discourse networks as the "Mother's mouth."

In writing a literary history of the telephone, one which takes into account its ideological roots in representations of women's aurality and disability, I am also engaging in a form of media studies. In doing so, my aim is to engage with critiques of past attempts to write definitive media histories, particularly Lisa Gitelman's observations of those histories' limitations:

> Some accounts of media history offer a sequence of inventors and machines, others trace the development of ideas or epistemologies, and still others chart a changing set of social practices, while many combine elements of several such approaches […] If there is a prevailing mode in general circulation today, I think it is a tendency to naturalize or essentialize media—in short, to cede to them a history that is more powerfully theirs than ours.[19]

While my rewriting of "The Romance of the Telephone" undoubtedly engages in an attempt to "trace the development of ideas or epistemologies" as well as "chart[ing] a changing set of social practices," my goal in writing this dissertation is to return the telephone's history back to its rightful beneficiaries: the d/Deaf and disabled community. Following Gitelman's assertion that "The introduction of new media […] is never entirely revolutionary,"[20] I argue that the telephone, rather than appearing naturally and spontaneously as a media technology, was in fact a well anticipated, inevitable outcome of nineteenth-century cultural investigations into the intersection of disability and women's aurality. Significantly, in her own discussion of media history, Gitelman relies on disability metaphors in order to explain how "media become

[19] *Always Already New: Media, History and the Data of Culture*, Cambridge: MIT Press, 2006, 1-2.
[20] Ibid, 6.

authoritative as the social processes of their definition and dissemination are separated out or forgotten," describing this process of forgetting as "amnesia."[21] Furthermore, in order for media to become fully culturally integrated and commercially successful, "the success of all media depends at some level on inattention or 'blindness' to the media technologies themselves."[22] I argue that Gitelman's disability metaphors of "amnesia" and "blindness" indicate the possibility that media in general, most certainly the telephone, derive authority and seeming transparency specifically by erasing their origins in disability. Far from coincidental or derogatory, Gitelman's disability metaphors reveal the process by which media histories delete intentionally their disabled pasts.

The Disabled Ancestry of Media Technology

The idea that disability is an origin point for the development of communication technology is well established in the emergent field of disability media studies. Jonathan Sterne locates the origins of the telephone in Alexander Graham Bell's work with the d/Deaf and his attempts to create "machines to hear for them."[23] Mara Mills argues that not only does hearing assistive technology and telephony co-evolve,[24] but also that the wearability and miniaturization of the early hearing aid led to the rapid development of computerized electronics in general.[25]

[21] Ibid.
[22] Ibid.
[23] "Growth of the Oral Method of Instructing the Deaf." 10 November 1894, Horace Mann School, 25th Anniversary Address. Reprinted in *The Annual Report of the Committee on the Horace Mann School*, Boston: Press of Rockwell and Churchill, 1896. http://www.loc.gov/resource/magbell.37600101
[24] "When Mobile Communication Technologies Were New," *Endeavour* 33 (2009): 140- 146.
[25] "Hearing Aids and the History of Electronic Miniaturization," *IEEE Annals of the History of Computing* (2011), 24-44.

Even in foundational media studies texts, it is clear that that critics locate disability at the "beginning" of nineteenth-century technological innovation, while meaningfully stopping short of expressing its significance as ideological or material impetus. For example Friedrich Kittler acknowledges disability only in passing: "A physical impairment was at the beginning of mechanical sound recording—just as the first typewriters had been made by the blind for the blind, and Charles Cros [the inventor of the phonograph] had taught at the school for the deaf and mute."[26] Such observations work to characterize the disability origins of technological breakthroughs as a curious coincidence, and the technologies themselves only as surprise byproducts of inventors' efforts to "fix" deafness or other disabilities.

As Mills argues, here disability functions as an "assistive pretext,"[27] a superficial excuse for the creation of technology that always falls short of a meaningful interaction with disability. Together with Sterne, she calls for "new stories about media, new histories, but also new theories that do not rely on disability as their, well, crutch."[28] While I agree that we need media theories with a new, sophisticated understanding of disability, I also think that canonical media studies scholars' use of troubling disability metaphors, which Sterne and Mills characterize as "ridiculous," is worthy of further examination, especially from a literary studies perspective. Take for example their citation of Kittler's later, deeply problematic characterization of the

[26] "Gramophone," 22.
[27] "Deaf Jam: From Inscription to Reproduction to Information," *Social Text*, 28.1 (2010): 35-58, 39.
[28] "Dismediation: Three Proposals, Six Tactics," in *Disability Media Studies*, ed. Elizabeth Ellcessor and Bill Kirkpatrick, New York: New York University Press, 2017, 365-376, 370. In their reference to disability as "crutch," Mills and Sterne cite David Mitchell and Sharon Snyder's concept of "narrative prosthesis," which argues that "disability has been used throughout history as a crutch upon which literary narratives lean for their representation power, disruptive potentiality, and analytical insight." (*Narrative Prosthesis: Disability and the Dependencies of Discourse*, Ann Arbor: University of Michigan Press, 2000, 49).

disability origins of technology: "cripples and handicaps lie like corpses along the technical paths to the present." [29] For Sterne and Mills this statement is a "titillating" example of a derogatory disability metaphor that has no use in disability media studies. I would argue that this statement needs to be dealt with on a deeper level, because Kittler's metaphorical "corpses" are also disturbingly literal reminders of eugenic and genocidal practices. Moreover, such statements reveal the true difficulty of resurrecting a technological timeline that honors and acknowledges our disabled ancestors, rather than—as Kittler would have it—stepping over their corpses.

I argue that the role that disability plays in media and technological creation must always be considered in light of the fact that "discourses of reproduction, generation, and inheritance are shot through with anxiety about disability."[30] Alison Kafer identifies the need to "imagine disability and disability futures otherwise, as part of other, alternate temporalities that do not cast disabled people out of time."[31] Part of this reimagining of disabled people's temporal inclusion is a reconsidering of the disabled past, taking seriously their presence, however minimized or denigrated, however metaphorical, in the historical materials that document their involvement in technological development. If we place disabled people alongside the assumed able-bodied, white male inventor, we can begin to rewrite a technological history that includes not just disability accommodation but disabled reproduction, an acknowledgement that these innovations

[29] He reprises his earlier statements about technology made by disabled people, for disabled people, but makes it clear that technological development is the desirable outcome of an otherwise repugnant beginning: "here are undoubtedly ways to go from aesthetic handicaps to media technology, even ideal ways. Just as technical media like the telephone and the gramophone were invented in the nineteenth century for and by the deaf, and technical media like the typewriter were invented for and by the blind, so began the first experiments with the darkening or lightening of certain chemicals in the seventeenth century, which directly led to photographic film through the work of Niepce and Daguerre. Cripples and handicaps lie like corpses along the technical path to the present," *Optical Media*, New York: Polity, 2010, 120.
[30] Alison Kafer, *Feminist, Queer, Crip*, Bloomington: Indiana University Press, 2013, 29.
[31] Ibid, 34.

contain materialized parts corresponding to our own non-normative functionality. As a concrete example of this alternative, disability-inclusive history in action, we might turn to Mill's account of Helen Keller's interaction with the hearing glove, an early cybernetic device, at Bell Labs. In addition to building upon 1950s innovations in electrical engineering, "The AT&T-sponsored project, in turn, reworked nearly a century of talking glove and touch alphabet development by deaf and deaf-blind inventors."[32] Both a product of Bell Labs and a product of generations of "deaf and deaf-blind inventors," Mills's hearing glove illustrates a new way of thinking about the interdependency between disabled people and technology, one that has to the potential to remind us of the fact that our use of assistive technology can also function as an inheritance, given that it is in a sense passed down to us by disabled makers and ancestors. By acknowledging the disabled people who participated actively in the development of technology, we can claim a disabled ancestry that allows us to reconfigure our own technological interactions and interdependencies.

Women, Technology, and Disability

Rethinking the history of technology in terms of disabled ancestry requires incorporating feminist theory together with disability and media studies. Since my project exists at the point of triangulation between gender, disability, and technology, I rely upon previous work by feminist scholars working on technology and gender, as well as feminist disability scholars and media scholars who have already investigated these points of intersection. Most notably, two canonical critical projects at the juncture of feminism and technology inform the way I approach this

[32] "On Disability and Cybernetics: Helen Keller, Norbert Wiener, and the Hearing Glove," *Differences: A Journal of Feminist Cultural Studies*, 22.2-3: (2011) 74–111, 85.

triangulation: Avital Ronell's *The Telephone Book* (1989) and Donna Haraway's "A Cyborg Manifesto" (1991). Ronell's work articulates the history of the telephone in terms of the maternal and genealogical, reading the invention of the telephone as an invention of the female body. She disputes the "master idea" that there was "one man, performing his singularity in a godlike way, screaming 'let there be telephones!'"[33] Referencing the patent war between Alexander Graham Bell and Elisha Gray, she argues that these two men "were not the only producers of our current object of inquiry […] we are dealing with the invention of a woman's body retransmitted through judicial procedures."[34] Her intervention into this "master idea" of the telephone and her explicit recasting of this technology as a female body in negotiation, together imply that the invention of the telephone is a key moment when femininity underwent new construction, and when technological communication became feminized as a result. These ideas run parallel to my own argument about how the telephone is anticipated, realized, and recreated by different literary representations of women's aurality, although I would argue that communication technology was feminized long before the creation of the actual telephone—this technology inherited its femininity rather than inventing it.[35]

On the other end of the line, perhaps answering indirectly Ronell's philosophical, non-prescriptive conversation about the telephone as a female body, is Donna Haraway. In a political call to action, Haraway articulates the relationship between the female body and technoscience in much more concrete and directional terms. Whereas Ronell sees the female body as an epistemological origin point for technology as well as its parallel invention, Haraway sees it as

[33] *The Telephone Book*. Lincoln: University of Nebraska Press, 1989, 280.
[34] Ibid, 280.
[35] Ronell's book is written to resemble an actual telephone book, with her own role as author defined by the switchboard operator connecting disparate conversations.

the user of technology: "Communications technologies and biotechnologies are crucial tools for recrafting our bodies. These tools embody and enforce new social relations for women worldwide."[36] What is interesting for me is how both of these critics, Haraway in particular, decide what embodies what – if the female body embodies the machine or vice versa. For a manifesto that directs its readers to "rejoice[] in the illegitimate fusions of animal and machine,"[37] it is surprising how unidirectionally Haraway imagines embodiment to be. She argues that "The machine is us, our process, an aspect of our embodiment. We can be responsible for machines; *they* do not dominate or threaten us."[38] Such a statement implies immense power, control, and ability on the part of women's bodies, a kind of authority that separates the biological female from the cybernetic device more than it brings them together.[39] Here, I do want to clarify that I find Haraway valuable because she articulates many of the same ideas I wish to express on the part of disabled people, regarding the use of technology for our own purposes. But like many other disability scholars, most notably Alison Kafer, I see this disabled use of technology as an alternative, futuristic way of being that should be function beyond the ideas of mastery or control.

For the purposes of my dissertation, observing that the intersection of feminism and technology inevitably evokes disability, even if uncritically, is validating for my argument. Both Ronell and Haraway raise the subject of disability deliberately in the service of their analyses.

[36] "A Cyborg Manifesto" in *The Cybercultures Reader* Ed. David Bell and Barbara M. Kennedy, London: Routledge, 2000, 302.
[37] Ibid, 312.
[38] Ibid, 315.
[39] Here I am agreeing wholeheartedly with Alison Kafer, whose chapter "The Cyborg and the Crip" effectively critiques Haraway's manifesto by revealing the abelist logic that lies behind many of her attempts to use the cyborg to blur the boundary between human and machine: "Although Haraway intended the figure to critique dualistic understandings of nature and culture or of human and machine, too often it serves only to reify such binary logic" (108).

Ronell brings up d/Deafness in particular in terms of ancestry: "Since one of the branches of its genealogical tree link it to the predicament of deafness, the telephone will always be hard of hearing, and thus unhinging."[40] Her use of the language of genes and inheritance, even if that inheritance is one of "predicament," echoes my articulation of how the telephone has inherited aspects of Deaf female embodiment, and how the Deaf should now inherit the telephone for themselves, perhaps an "unhinging" of its intended purpose or a reconnection back to it. The persistence of the telephone's "hard of hearing" nature is clear to Ronell, even if the full complexity of that disabled nature remained obscure when she wrote *The Telephone Book*.[41] Here, in my approach to Ronell I follow Alison Kafer's response to Haraway, where she argues that for Haraway, "Disability may be an excellent site for witnessing the blurring of human and technology, but not, apparently, for exploring actual experiences of such blurring."[42] For Haraway and Ronell, both writing more than twenty-five years ago, disability remains both extreme and abstract, seen as not worthy of the same complex subjectivity and deep examination that they grant to femininity and technology. My project will examine both of these critics in greater detail in order to glean what they have to offer, but also perform an intervention similar to those already performed by feminist disability scholars.

Indeed, the scholars working at the point of intersection between feminism and disability studies have been intervening to the benefit of both fields for decades, and my project has the

[40] *The Telephone Book*, 328.
[41] There are a number of uncritical or ignorant statements about Deaf and hard of hearing people in Ronell's work, most notably this one: "Try to imagine the prelingually deaf, unable to hear their parents, denied entry into the Symbolic. Empirically, they risk being severely impaired, defective in their grasp of language" (328). But these statements do not disqualify Ronell's approach to d/Deafness and the telephone; rather they reinforce the notion that the functional object of the telephone, a "child" of the d/Deaf community, also runs the same risks of being "impaired" or "defective."
[42] *Feminist, Queer, Crip*, 115.

advantage of resting on a number of critical projects that have argued for the inclusion of disabled women in feminism and invented the field of feminist disability studies. Susan Wendell asserts the foundational point that we need a feminist disability theory not only because many disabled women exist in the world, but also "because feminist thinkers have raised the most radical issues [a]bout cultural attitudes to the body."[43] Rosemarie Garland-Thomson articulates the relationship between feminist theory and disability studies more pointedly, arguing that disability has a unique capacity to "pressure feminist theory to acknowledge bodily particularity and history."[44] She perceives disability studies as an insistent reminder of embodied discourses that feminism has at times attempted to elide or escape. Following her reading of Aristotle, Garland-Thomson observes that "even the ideal female body is abnormal compared to the universal standard of the male body,"[45] making the argument that women's embodiment *is* disabled embodiment according this dominant discourse. She also perceives the close parallels between disability and femininity as the grounds for historical inquiry: "Not only has the female body been represented as deviant, but historically the practices of femininity have configured female bodies in ways that duplicate the parameters of disability."[46] Her exploration of how women's bodies come to be defined by the pathological conditions of their historical moment, from the nineteenth- and early twentieth-century freak show's racialized and dehumanized bodies, to the sentimental figure of the American nineteenth-century female dependent, is crucial to my work. As I examine nineteenth-century representations of women's auralities, I rely upon

[43] "Toward a Feminist Theory of Disability," *The Disability Studies Reader*, ed. Lennard J. Davis, 261.
[44] "Feminist Theory, the Body, and the Disabled Figure," *The Disability Studies Reader*, ed. Lennard J. Davis, 284.
[45] *Extraordinary Bodies*, 28.
[46] Ibid 286.

her work in particular in order to create a new, historicized understanding of the relationship between disability and femininity.

From these two important inroads in the field of feminist disability studies emerges a path towards understanding disability and femininity in the context of technology and media studies. Ellen Samuels's *Fantasies of Identification* argues that emergent technologies like fingerprint cataloging and DNA testing represent and enact a desire to "definitively identify bodies, to place them in categories delineated by race, gender, or ability status, and then to validate that placement through a verifiable, biological mark of identity." Her work examines how these "fantasies of identification" depend upon a scientific, medical, or technological framework that justifies their cultural function in the face of outright disproval or resistance. Although her work does not self-consciously identify itself as disability media studies, its emphasis on different technologies' enabling of cultural perceptions about disability, gender, and race is instrumental in understanding how disability studies perceives technology's relationship with disabled people.

Samuels's theory of fantasies of identification is a valuable start to an explanation of how the telephone, which was developed alongside other hearing assistive technologies intended for d/Deaf people, negotiates the territory between sensory experimentation and sensory diagnosis. Bell Labs's development of audiometers alongside the telephone points to a specific desire to identify hearing losses while also exploring the broader capabilities of sonic communication. Hearing aids, cochlear implants, and other hearing assistive devices attempt to fulfill the fantasy of correctly identifying who is d/Deaf and who is not, but their more experimental and potentially activist functions have remained largely unexplored. In other words, these technologies have yet to be read in the context of Aimie Hamraie and Kelly Fritsch's assertion that technoscience has more to offer the disabled, crip community:

> To date, crip theorists have had limited engagement with the critical concept of technoscience, particularly as it is used in feminist [studies] to mean the productive and non-innocent entanglement of scientific knowing and technological making. This limited engagement has yielded an ahistorical position that science, technology, and medicine are anathema to crip world-remaking, ignoring disabled peoples' ongoing, creative, and open-ended appropriations of science, technology, and medicine, particularly in acts of protest and "epistemic activism."[47]

My dissertation, then, is in many ways about adding to the current focus in disability studies that tracks how technoscience is currently being used to police, control, and erase disabled bodies, particularly bodies that exist at the point of intersection of queer sexuality, femininity, and race.[48] While this work is undeniably justified, and, to say the very least, deserving of a great deal more investigation given our current political position, I have chosen to create a project that focuses on disabled people, in the past and potential future, as creators who have passed down, inherited, and paid forward different forms of technology for our own purposes.[49] Using the example of the telephone, I argue that even given the overwhelming

[47] Aimie Hamraie and Kelly Fritsch, "Crip Technoscience Manifesto," *Catalyst: Feminism, Theory, Technoscience* 5.1 (2019): 1-34, 3.

[48] Here in particular I am thinking about Alison Kafer's work on disabled women's reproductive rights and how disabled bodies are purposefully excluded from our society's vision of its own future (*Feminist/Queer/Crip*).

[49] Once again, I would like to point out how the idea of disabled reappropriation of potentially oppressive forms of technology forms a dialog with Afrofuturism. Mark Dery defines Afrofuturism as "speculative fiction that treats African-American themes and addresses African-American concerns in the context of twentieth-century technoculture – and more generally, African-American signification that appropriates images of technology and a prosthetically enhanced future" ("Black to the Future: Interviews with Samuel R. Delaney, Greg Tate, and Tricia Rose," in *Flame Wars: The Discourse of Cyberculture*, Durham: Duke University Press, 1994, 180).

evidence that the telephone is linked to a specific oralist and eugenicist agenda,[50] we can still excavate the telephone's history and find evidence that disability was and will be valued. It is, in fact, possible to co-opt a technology in part founded on the premise of eradicating d/Deafness in order to validate and celebrate d/Deafness. I believe that by examining the telephone's history in the context of broader discourses surrounding women's aurality, we can begin to imagine technology not just as a way to eliminate disability in the future, but as experimental mediums through which different modes of embodiment and sensory perception can be explored by disabled people and able-bodied people alike.

Methods of Organization

In choosing the history of the telephone as my main focus, I am also making choices about what particular organizational methods suit my purposes. I see my project in dialog with a longer tradition of feminist revisionist histories, which have in the past placed emphasis on women's voices in order to recover previously unrealized or forgotten women's perspectives.[51] That the work of recovery places so much emphasis on voice and agency is key to my work and the work of other disability scholars, since this approach seems to exclude women who couldn't speak, or couldn't act, or whose speaking and acting has gone unrecognized as such. In my readings of canonical literature as well as recovered texts, I aim to explore how women's aurality transforms them into sonic mediators rather than just listeners or speakers.

[50] See Alexander Graham Bell's explicitly eugenicist paper, "Memoir upon the Formation of a Deaf Variety of the Human Race" (1883).
[51] The bulk scholarly work examining women's representations or the representation of sound in 19th century texts focuses on the idea of voice: see Claire Kahane's *Passions of the Voice* (1995) and Ivan Krielkamp's *Voice and Victorian Storyteller* (2005) as primary examples.

In addition to demanding a more flexible understanding of women's aurality, the history of the telephone also requires a selection of texts that span a certain timeframe and geography. I am choosing texts that date just before, during, and after the invention of the telephone in order to show how representations of women's aurality anticipate, participate in, and respond to that technological innovation.

My first chapter, "Anticipating the Telephone: Reading Charlotte Brontë's *Jane Eyre* and George Eliot's *The Mill on the Floss* as Speculative Fiction," reads two canonical English novels, Charlotte Brontë's *Jane Eyre* (1847) George Eliot's *The Mill on the Floss* (1860) as speculative works of fiction that collectively anticipate the imminent arrival of late nineteenth-century communication technologies. I argue that these two bildungsromans engage in a specific type of world-building that relies on the aurality of their heroines in order to imagine future worlds more accessible to and inclusive of femininity and disability. I also analyze Brontë's and Eliot's engagement with their contemporary sonic and scientific theory, which influences not only their world-building but also their portrayal of women's sonic mediation. Connected through their mutual acquaintance with Harriet Martineau, a well-known deaf author, both Brontë and Eliot share a common awareness of the full spectrum of women's aurality, an awareness that allows their respective heroines, Jane Eyre and Maggie Tolliver, to embody a futuristic sense of the capabilities of sound travel and communication.

My second chapter, "The Deaf Ancestry of the Telephone: Alexander Graham Bell in Crip Time," examines the narratives of invention surrounding the telephone that are intertwined with the rise of oralism and eugenics. It argues that deaf ancestry of the telephone, created by Alexander Graham Bell's close involvement with the Deaf community as a deaf educator and as the son and husband of deaf women, effectively projects this technology into a disabled future

and illustrates how its history resists conforming to normative temporalities of progress, development, and cure. Through an analysis of nineteenth-century and modern critical sources' metaphors of heredity and genealogy, including Bell's *Memoir Upon the Formation of a Deaf Variety of the Human Race* (1883), I argue that telephone's explicit origin in deafness deserves greater critical attention than it has received in the past. The primary historical materials surrounding the invention of the telephone and Bell's later, eugenic work refer continually to evolution, inheritance, and ancestry as they construct arguments about the origin of technological innovation and disability and the relationship between the two. Because oralism and eugenics ascribed to the notion that Deaf people embodied backward and un-evolved human communication, the idea that Deaf subjectivity in fact lies at the very inception of a futuristic, innovative technology like the telephone allows us to combat eugenic temporal logic and imagine a new, disabled futurity.

My third and final chapter, "Accessible Telephony: Women Operators in Florence McLandburgh's 'The Automaton Ear' and Elizabeth Stuart Phelps's 'The Chief Operator,'" examines how two recovered texts, one written a few years before the invention of the telephone in 1877 and one written after the national expansion of the Bell telephone system, engage with issues of accessibility. Weaving together critical background on the telephone's media history with these literary sources, I argue that both texts are engaged in the practice of frictional accessibility, whereby "science and technology can be used to both produce and dismantle injustice."[52] Drawing on material from both previous chapters, I observe that the telephone's accessibility is informed by the parallel creation of an oralist network of women teachers of the d/Deaf alongside a media network of women telephone operators, both of which worked together

[52] Hamraie and Fritsch, 3.

to standardize oral language pedagogically and technologically. In McLandburgh's "The Automaton Ear," we can see that even a few years prior to the actual patenting and invention of the telephone there was an ongoing cultural awareness of the connection between communication technology's potential accessibilities and d/Deaf women. I also refer to the literary representations of women's sonic mediation in my first chapter, arguing that the representation of the woman telephone operator in Phelps's "The Chief Operator" is a literary descendant of Maggie Tolliver. This chapter reveals ultimately that these literary and media representations of women's sonic mediation connect back to the telephone's disabled origins.

Chapter One

Reading Charlotte Brontë's *Jane Eyre* and George Eliot's *The Mill on the Floss* as Speculative Fiction

The goal of this chapter is to read two women's bildungsromans, Charlotte Brontë's *Jane Eyre* (1847) and George Eliot's *The Mill on the Floss* (1860) as speculative fiction. In other words, instead of reading these canonical novels as solely products of their own time and place, as historical records, I will be reading them as if they were anticipatory science fiction.[1] My purpose in doing so is an attempt to shift how we read these women authors and their fictional creations. Instead of reading these women authors and the heroines they create as strictly limited to their particular cultural and historical moment, I imagine these novels as invested distinctly in the future. I propose that these bildungsromans were more preoccupied in imagining women in a world that did not yet exist, in projecting versions of their own femininity into future, creative spaces that are more theoretical than have been realized.

I imagine them as participating in a world building project, redesigning the relationship between women's bodies and their natural and social worlds, and focusing specifically on the changing nature of communication, aurality, and sensory experiences which characterizes their heroines as sonic mediators. These novels contain both a current and futuristic sense of how sound was imagined in their time, and how it would be conceptualized much later in the 19th century and into the 20th century. Both authors participate in a continuation of a Romanticist

[1] As Sami Schalk points out in her groundbreaking work on disability in Black women's speculative fiction, this genre "allows us to imagine otherwise, to envision an alternative world or future in which what exists now has changed or disappeared and what does not exist now, like the ability to live on the moon or interact with the gods, is suddenly real." *Bodyminds Reimagined: (Dis)ability, Race, and Gender in Black Women's Speculative Fiction*, Durham: Duke University Press, 2018, 2.

project to make sense of the natural world through its collective artistic and scientific exploration. But even more remarkably, Eliot and Brontë also anticipate the radically altered and gendered mediascape that came to exist after the advent of sound technology, particularly the telephone system. Reading the novels' representations of sound, women's aurality, and d/Deafness, I produce a reading that integrates the authors' contemporary awareness of scientific discovery together with their literary innovation of alternative worlds.

Reading these bildungsromans as anticipatory science fiction also allows us to examine these authors' process of world building. I see this term in two ways—the first in an entirely literary sense, where "world building" refers to the amount of detail and realization in fiction, especially in genres that create fictional worlds very different from the real world of their readers. This is what Ursula LeGuin calls "the authentic thrill of being taken *absolutely elsewhere*," which she locates, surprisingly, not just in her own territory of science fiction, but in the work of authors such as Virginia Woolf. LeGuin locates her own education in creative world building in *Orlando*, where Woolf "imagined a society vastly different from our own, an exotic world, and brought it dramatically alive […] By precise, descriptive details, not heaped up and not explained […] encouraging the reader's imagination to fill out the picture and see it as luminous, complete."[2] Although Brontë and Eliot write what is often billed as realism, their fictional worlds often veer into this territory, simply because they are creating spaces for their intellectually vibrant female characters to exist within the traditional, masculine framework of the bildungsroman. I argue that what concerns these women authors is not only the building up

[2] "Learning to Write Science Fiction from Virginia Woolf," *Words Are My Matter: Writings about Life and Books, 2000-2016,* Easthampton: Small Beer Press, 2016, 45.

of a central character, as would be the case in a more typical bildungsroman, but of a world in which that female character can feasibly exist.

The second sense of world building is in this vein. These authors' social examination of their own contemporary world questions who is allowed in this world, and for whom this world is currently designed. Viewing these novels as critical and fantastical reflections of the world their authors currently occupy offers us a glimpse into the world that Brontë and Eliot wish to project—an accessible and inclusive space for their heroines, for their own authorial presence, and even their contemporary readers. I pull this sense of world building from Rosemarie Garland-Thomson's analysis of Kazuo Ishiguro's *Never Let Me Go*, a 21st-century dystopian science fiction novel (2005) and film adaptation (2010). Garland-Thomson identifies two types of world building, inclusive world building, which "seeks to integrate people with disabilities into the public world by creating an accessible, barrier-free material environment,"[3] and eugenic world building, "which strives to eliminate disability and, along with it, people with disabilities from human communities and future worlds."[4] Although *Jane Eyre* and *The Mill on the Floss* obviously predate modern eugenics,[5] I would argue that they are similarly caught up in conflicting ways of building a world with or without disability, or writing novels in which disability exists, albeit with severe limitations and specifications.

Individual characters function as outlines of the pervasive presence of disability in the fictional worlds of both novels. Philip Wakem's hunchback, Mr. Rochester's missing limb and

[3] "Eugenic World Building and Disability: The Strange World of Kazuo Ishiguro's *Never Let Me Go*," *Journal of Medical Humanities,* 38.2 (2007): 134.
[4] Ibid, 134.
[5] Francis Galton, a cousin of Charles Darwin, published his theories on hereditary intelligence in *Hereditary Genius* (1869). He did not coin the term "eugenics" until the publication of his 1883 book *Inquires into Human Faculty and Its Development*.

blindness, and Bertha Mason's madness are arguably some of the most memorable features of these narratives. By the close of these novels, the disability of individual characters has been condemned or erased: Philip Wakem has been rejected as a suitable mate because of his deformity, Mr. Rochester's blindness has been cured, and Bertha Mason has been killed. If we read these novels according only to these literal portrayals of disability, it follows that both Eliot and Brontë participate wholeheartedly in a type of proto-eugenic world building, where they deliberately build worlds inclusive of disabled characters only to eliminate them or reveal their incompatibility with the novels' projected futures. But if we expand our definition of disability to include not just the explicit disabilities of characters, but also the metaphorical uses of physical difference, a different picture emerges. Here, my analysis is in line with Rebecca Sanchez's call "for renewed analysis of the embodied nature of language," in which disability "demonstrate[es] the broad and nonidentitarian ways in which it might interact with other fields of study."[6] Sanchez questions disability studies' primary focus on disabled characters or disabled authors, and argues that disability, and more specifically Deafness, can be a wider lens through which we read all literature, especially when we attend properly to a text's inclusion of disability in its figurative language.

Both Eliot's and Brontë's novels are full of repeated metaphors of blindness, deafness, and other sensory or intellectual differences and presumed deficiencies. Instead of reading these metaphors as negative indicators of the stigma against disability, referring literally to "real" disabilities,[7] we can instead read how disability is used to expand ideas of sensory experience,

6 *Deafening Modernism: Embodied Language and Visual Poetics in American Literature*, New York: NYU Press, 2015, 5.
7 David Mitchell and Sharon Synder, *Narrative Prosthesis: The Materiality of Metaphor and the Dependence of Discourse,* Ann Arbor, Michigan: The University of Michigan Press.

gender, and female intellect. Contrary to these author's treatments of explicitly disabled characters, this figurative language is often valorized, and designed to deepen the experience of female characters and validate their position in their fictional world. Disability metaphors, in these texts, convey LeGuin's sense of "the thrill of being taken absolutely elsewhere"—communicating disabled embodiments that would seem alien to many readers, and familiar to others. Read in the context of speculative fiction, these novels' figurative inclusion of disability within women's bildungsromans creates a space for identity categories to be reimagined and questioned. As Sami Schalk points out, "[t]he genre of speculative fiction particularly lends itself to such complexity because its nonrealist conventions can be used to highlight the socially constructed, and therefore mutable, nature of concepts like (dis)ability, race, and gender […] speculative fiction can alter the meanings of these categories, requiring readers and critics alike to adapt our modes of reading, interpretation, and analysis or develop new ones."[8] Disability metaphors convey the "mutable" nature of disability as a category of identity, acting as invitations into an imaginative, speculative mode of reading and world building. They are tools for building and adapting the women's bildungsroman—allowing authors to adopt a critical position from which they can anticipate an inhabitable, creative space for their main characters.

The disability metaphors in these bildungsromans that most interest me concern deafness, aurality, and more broadly communication. The abundance of these metaphors indicates the authors' preoccupation with sensory difference and with contemporary scientific theories of sound and transmission, which would eventually become realized only decades later with the invention of the telegraph and telephone. They are also revelatory of the association between

[8] *Bodyminds Reimagined*, 9.

aurality and femininity. Both narratives showcase the full spectrum of women's aurality, from deafness to superhearing, using the act of sonic mediation as a creative force. In doing so, they demonstrate an attitude toward women's sensory experiences that falls within the parameters of disability by virtue of embracing radical differences from the norm.

Brontë, Eliot, and Harriet Martineau

Indeed, Brontë and Eliot had reason to associate women's intellect and authorship with deafness because of their professional relationships with author and proto-sociologist Harriet Martineau. By the launch of their respective literary careers in the 1840s and 1850s, Martineau was arguably "the most famous, and the most well-established woman author of her day,"[9] known primarily for *Illustrations of Political Economy* (1823-24), her novel *Deerbrook* (1839), but also for publications that announced her deafness, *Letter to the Deaf* (1834) and *Life in Sickroom* (1844). Her impact on both later authors was significant: Deirdre David notes that "George Eliot declared her to be a 'trump—the only woman that possesses thoroughly the art of writing,'"[10] and Linda Peterson argues that Charlotte Brontë idolized and sought out Martineau, in addition to Elizabeth Gaskell, as replacements for the intimate, intellectual companions she had in her sisters Anne and Emily.[11] In seeking out and to a large extent modeling themselves

[9] Linda Peterson, "Triangulation, Desire, and Discontent in 'The Life of Charlotte Brontë,'" *Studies in English Literature, 1500-1900*, 47.4 (2007): 901-920, 903.

[10] "George Eliot's 'Trump': Recent Work on Harriet Martineau," *Victorian Studies*, 47.1 (2004): 87-94, 88.

[11] Peterson, 902-904.

after Martineau, Brontë and Eliot relied on her presence in their world as a navigational point for their own professional identity and writing.

Martineau's deaf identity was at the center of her iconography as an established author. For example, a 1832-1833 portrait engraving depicts her in a conventionally feminine manner, impeccably dressed and groomed, and gazing off into the distance. But as Alex Wettlaufer argues, in addition to these more predictable aspects of the portrait, "the most striking aspect of the image is Martineau's right hand, which is cupped around her ear, foregrounding the fact that the sitter had been going progressively deaf since adolescence and relied on a trumpet to hear."[12] In place of portraying a hearing prosthetic, the portrait explicitly evokes her deafness through the positioning of Martineau's hands, showing her augmenting her own listening through gesture. According to Wettlaufer, this portrait combines visual signals of femininity and deafness in a way that "foregrounds the radical author's difference, locating it both in her gender and her disability."[13] The image works jointly with Martineau's published work on her own disabled experience, "celebrating rather than occluding her deafness, and thus privileging femininity and disability as sources of strength, authority, and inspiration for social progress and reform."[14] What made Martineau such an extraordinary author and role model was her status as a disabled woman intellectual. She wrote her disability into the literary marketplace, establishing a space for women's radical thinking that relied on the intersection of gender and disability, a professional intervention that acted as a kind of world building in and of itself. Brontë and Eliot

[12] *Portraits of the Artist as a Young Woman: Painting and the Novel in France and Britain, 1800-1860*, Columbus: Ohio State University Press, 2011, 279.
[13] Ibid, 280.
[14] Ibid, 281.

inherited this space, and although not disabled themselves, they nonetheless built their fictional worlds out of the same materials that Martineau had used for her own self-construction.

Although separated by a generation, Martineau also shared an intellectual background with Brontë and Eliot that shaped each author's literary career, and that can help explain their collective focus on sensory difference, communication, and inventing new ideological spaces. All three women received educations abroad in Continental philosophy, becoming translators—an accepted form of female intellectual activity—of some of the same discourses that would later shape Victorian scientific thinking. As Lesa Scholl observes, the translations of Martineau, Brontë, and Eliot subverted the expectation that their translations were solely in the service of the original, male authors. Instead, they took advantage of the fact that by "exploring continental philosophies that were emerging and being rediscovered, especially from Germany and France, women who could translate were empowered to imagine a different discourse and ideological space."[15] Scholl argues that in translating key European philosophical works—mainly Eliot's translation of David Strauss's *Life of Jesus* (1844), which introduced a theological history based on rationalism and material science, and Martineau's translation of Auguste Comte's *The Positive Philosophy of Auguste Comte* (1853), which sought to unify the sciences into a cohesive system of ideas—these authors participated actively in reshaping of Victorian ideology. In creating greater accessibility to these Continental ideas through their translations, and by imagining the possibilities that these new ways of thinking had for repositioning Victorian women, these authors participated an act of inclusive world building within their own literary marketplace, in addition to their fictional worlds.

[15] *Translation, Authorship, and the Victorian Professional Woman: Charlotte Brontë, Harriet Martineau, and George Eliot*. Farnham: Ashgate, 2011, 2.

Understanding the construction of Brontë's and Eliot's fictional, yet natural, worlds requires understanding that these women authors did not encounter the rigid boundaries between literature, philosophy, and science that we encounter today in the 21st century. Charlotte Brontë's education in Brussels under the tutelage of Constantin Hegèr, a teacher in mathematics, translations, and composition, greatly influenced her perspective on her own teaching and writing.[16] Her fictional characters, most notably Jane Eyre, were the remediations of Brontë's pedagogical and intellectual experiences abroad, which included her own pushback against her teacher's attitude toward art, imitation, and creative genius.[17] Eliot's education and writing was even more immersed in Continental philosophy, particularly in the mid 19th-century reorganization of the sciences and incorporating rational thinking into religious and moral questions.

My interest in these authors' Continental education and translating is twofold: first that they demonstrate firsthand knowledge of scientific and philosophical theories, with which both Brontë and Eliot later used to fuel their speculative fiction; and second that the very act of translation is a type of mediation, which both authors continued to explore in their representations of sound, communication, and deafness. The idea that a faithful translation, especially by a female translator, would be a passive act of listening on another's theories and re-voicing them as accurately as possible, must have been responsible for its popularity as a nineteenth-century form of feminine education. But far from being a passive action, translation turns into a form of active and creative listening or rewriting, one that both authors fully embraced, even going so far as to rewrite the misogyny of some male philosophers.[18]

[16] Ibid, 43.
[17] Ibid, 50.
[18] For example, Scholl argues that "Martineau clearly resists and manipulates [Auguste Comte's]

In attending to both authors' background in translation, which later influenced the world building of their novels, it becomes apparent that both Brontë and Eliot were attuned to creative and sometimes rebellious act of receiving, reading, or hearing a text, rather than just invested in voicing their characters. These authors were focused on all aspects of women's aurality—its vulnerability to human sensory difference, its reliance on sound and language, and its potential for mapping the fictional worlds of their heroines. These early acts of inclusive world building, of expanding the accessibility of ideas through translation, came to fruition in their later novels.

The Development of Sonic Resonance

Brontë and Eliot were the heirs to Romanticist theories of sonic resonance, which began to be refined in the late 18th century and beginning of the 19th century until they were eventually realized in the form of sound technology. Most influential, perhaps, was Denis Diderot's theory of sonic resonance intertwined with philosophical enlightenment:

> The sensitive vibrating string oscillates and resonates a long time after one has plucked it. It's this oscillation, this sort of inevitable resonance, that holds the present object, while our understanding is busy with the quality which is appropriate to it. But vibrating strings have yet another property—to make other strings quiver. And thus the first idea recalls the second, and these two a third, then all three a fourth, and so it goes, without our being able to set a limit to the

work in her translation," particularly when it came to his belief "that science proves that women are less able than men" (55).

> ideas that are aroused and landed in a philosopher who meditates or who listens to himself in silence and darkness.[19]

As Veit Erlmann argues, Diderot characterizes the position of the philosopher as one of resonance rather than reason. Reason implies a separation, objectivity, and independence between to subjects, whereas resonance is a communion, a sympathy, and a mediation.[20] Rather than espousing theory independently, a philosopher instead relies on a system of interdependent resonating ideas.I would also add that this unique positioning of the philosopher also relies on a sensory void, since these resonating ideas are only received in a place of "silence and darkness." This suggests to me that the absence of sound and light—possibly embodied as deafness or blindness in these extremes—is necessary to the philosophical idea of resonance, since sympathetic vibrations can only be felt if one turns inward, shutting out one or more sensory inputs in order to perceive them.

The Romantic theory of resonance, the predecessor of modern conceptions of acoustics and sound waves, was also steeped in late 18th-century and early 19th-century conceptions of psychological and physical being. Influenced by these ideas, the poet William Cowper articulated how bodies receive sound as both an emotional and embodied experience: "There is in souls a sympathy with sounds, / And as the mind is pitched the ear is pleased / With melting airs or martial, brisk or grave; / Some chord in unison with what we hear / Is touched within us, and the heart replies" (*The Task* VI. 1). A sympathetic sound transforms the human body into an instrument itself, as in response to sound "Some chord in unison with what we hear / Is touched

[19] *Entrentien entre d'Alembert et Diderot* (1769), in Denis Diderot, *Oeuvres*, Paris: Gallimard, 1951, 876. Quoted and translated in Veit Erlmann's *Reason and Resonance: A History of Modern Aurality*, New York: Zone Books, 2014, 9.
[20] Ibid, 10.

within us, and the heart replies." In imagining the body as its own string instrument, mirroring the source of the sound itself, Cowper imagines human bodies as resonating together, as achieving unity through their collective, reciprocal response to certain aural stimuli. In parallel with this model of individual reciprocity, where the sympathy of sound reveals the symbiotic structure of a singular human mind and body, the poem also reveals a greater, interconnected sonic and social structure. Particular parts of the human body, "the mind," "the ear," and finally "the heart," become part of Cowper's universal "we" and "us," indicating that all listeners are integrated into a universal and interdependent system of call and response. Such a choice of word, transforming what could be regarded as a purely affective term into a concept that bridges between collective human physical and psychological feeling, underlines the interdependency between human beings themselves. This poetic understanding of the sympathetic dimension of aurality anticipates and influences later 19th-century fiction's and scientific theory's representation of sound.

Later, scientific examinations of the sympathetic qualities of sound are more specific about how certain sounds achieve their resonance, making it clear that human hearing should be understood as selective rather than collective. Ohm's acoustic law, proposed by Georg Ohm in 1843,[21] states that "The principle that a complex musical sound is heard as the sum of a number of distinct pure tones."[22] The audibility of those tones varies, as this law also specifies that "a pitch corresponding to a certain frequency can only be heard if the acoustical wave contains

[21] Ohm's acoustic law had a profound influence on later scientific thinkers who continued to theorize about how sound was perceived by humans, specifically Hermann von Helmholtz (Erlmann, 226).
[22] *OED*, "Ohm's law" n. 2.

power at that frequency."[23] This advance in the theoretical understanding of sonic resonance, where an equivalence in frequencies' power is necessary for a human ear to hear a certain pitch, or for two frequencies to resonate sympathetically with one another, indicates a parallel understanding that sympathy, especially in its emotional and social capacities, also depends on equivalencies of status and power. By the mid-19th century, the scientific and cultural understanding of sound had tempered the universal, collective, Romanticist theory of sonic resonance, making the occurrence of sympathetic sound a desirable exception rather than a given rule.

Sympathetic Resonance and Sonic World Building in *Jane Eyre*

Writing in the late 1840s, Charlotte Brontë had been noticeably influenced by the sense of sympathetic sound found in William Cowper's poetry,[24] as well as the more current understanding of the selective and specific functions of sound perception proved in Ohm's acoustic law.[25] As Lori Nandrea argues, in *Jane Eyre* sympathy figures as both a sonic or musical metaphor and an expression of emotional relationships, indicating a synergetic

[23] David M. Howard and Jamie A. S. Angus, *Acoustics and Psychoacoustics,* Oxford: Focal Press, 2006, 123.
[24] The Brontë family would have been extremely familiar with William Cowper's poetry, as indicated by records of their library's holdings. In addition, Anne Brontë paid tribute to the poet in her published poem, "To Cowper" in a collection of poetry by the three sisters, *Poems* (1846). Janet Gezari, "The Poetry of the Brontës" in *The Brontës in Context*, ed. Marianne Thormählen, Cambridge: Cambridge University Press, 2012, 136-137.
[25] In addition to aural sympathy, Lori Nandrea finds other evidence of the biological understanding which may have influenced Brontë. "Contemporary medical discourse, which was not cleanly separated from either philosophy or literature, often promoted a concept of 'communication' based on the belief that nerves responded directly to internal and external stimuli of all kinds, like the strings of a musical instrument." "Desiring Difference: Sympathy and Sensibility in Jane Eyre," *Novel*, 37.1 (2003), 112- 134, 114.

connection between the physical act of hearing and the psychological act of feeling.[26] But the connection between sympathy, sound, and the problems in human communication have been read almost exclusively in terms of affect, and rarely in terms of how this affect may relate to scientific theory. I argue that Brontë's reliance on sonic metaphors and the theory of aural sympathy enact world building, giving us speculative fiction. Indeed, these theories of how human beings hear, and how sound is both transmitted and received, are part of her project to invent a future space for her heroine to thrive in. Brontë builds her fictional world by integrating the Romantic theory of resonance—that human beings function like musical instruments, and resonate with the world around them—with the later, early theory of frequency equivalence—that sound can only be perceived if the producer and receiver are operating on the same frequency. Jane functions as an embodiment of these theories, becoming ultimately an experimental figure that predicts their later technological use.

Critical examinations of aurality and voice in *Jane Eyre* also examine the innovative spaces that Brontë opens up in her bildungsroman, both in terms of gender and in terms of broader, contemporary social changes. They have not, however, attended fully to the relationship between Brontë's fictional aurality and the cultural and ongoing scientific redefinitions of sound.[27] In his examination of the aural, yet withheld nature of Jane's narration in the novel, Ivan

[26] Lori Nandrea argues that this type of sympathetic communion also extends to the reader: "sympathy is transactional and reflective, about putting oneself in another's place, and in a fictional context sympathy becomes mimetic, whereby the reader mirrors the emotional experience of a character through their spectacle" ("Desiring Difference," 114). For a definition of sympathy specific to affect and 19th century authors, I turn to Ann Cvetkovich, "The Inside Story: Sympathy in *Daniel Deronda*" in *Mixed Feelings: Feminism, Mass Culture, and Victorian Sensationalism*, New Brunswick: Rutgers University Press, 1992.

[27] Examinations of other scientific and pseudoscientific allusions in the novel focus on Brontë's use of her contemporary fields psychology and phrenology (Tressler), her inclusion of heredity theories of madness and racism as a kind of proto-eugenicist (Donaldson), and her narrator's outright dismissal of superstition in favor of natural phenomena (Smajić). See Beth Tressler,

Kreilkamp comes closest in his placement of Brontë's writing within the context of a shifting mediascape: "*Jane Eyre* incorporates speech into writing and makes 'fierce speaking' compatible with a highly effective print culture."[28] He also goes far to suggest that the narrator's "vocal violence […] forcibly constructs new social spaces in which a writing-based subjectivity might be recreated."[29] Second-wave feminist critics also place greater emphasis on Jane's voice rather than a broader sense of aurality that includes listening, arguing that her voice creates a feminist or proto-feminist imperative to control one's own history and narrative.[30] Later feminists argue that Jane's voice is far less masterful, instead aimed at creating a more open and ambiguous relationship between author and narrator, text and reader. As Carla Kaplan argues, within the patriarchal world of the literary marketplace and in the fictional universe of the novel, "Jane's desires as a speaker" are in fact a "struggle" which "is not wholly successful."[31] The questionability of Jane's feminist voice might be attributable to its fundamental alterity, its inseparability from other representations of her sensory experience via vision and hearing. Indeed, Lori Nandrea makes the case that Jane's identity is fundamentally disjointed, and that Brontë embraces that disjointedness through her representations of her main character's sensory differences. She argues that Brontë, far from seeking out a comprehensive and harmonious text,

"Illegible Minds: Charlotte Brontë's Early Writings and the Psychology of Moral Management in Jane Eyre and Villette," *Studies in the Novel*, 47.1 (2015): 1-19, Elizabeth J. Donaldson, "The Corpus of the Madwoman: Toward a Feminist Disability Studies Theory of Embodiment and Mental Illness," *NWSA*, 14.3 (2002): 99-119, and Srdjan Smajić, "Supernatural Realism," *NOVEL*, 42.1 (2009): 1-22.

[28] *Voice and the Victorian Storyteller*, Cambridge: Cambridge University Press, 2005, 138.

[29] Ibid, 137.

[30] Janet Freeman argues that Jane's voice allows her to "have her history firmly in her own possession" which allows her to also "possess her silent readers as well" (700). "Speech and Silence in *Jane Eyre*," *Studies in English Literature*, 24.4 (1984): 683-700.

[31] "Girl Talk: *Jane Eyre* and the Romance of Women's Narration." *Novel* 30.1 (1996): 5-31, 14.

chooses instead to "explor[e] the profoundly creative inherent in distances that cannot be bridged."[32]

My own reading of *Jane Eyre* argues that Brontë is actually greatly interested in bridging distances via sound, and uses her heroine's unusual aurality as a conduit for exploring the faults in human connections only to ultimately position her in the most advantageous way possible. After all, the flipside of Jane's feminist voice, which is complete control of her own history as she recounts her life story to the reader, is her hearing, which similarly perceives every minute detail of her fictional world. But faultless aural perception, in this case, is profoundly disabling for the heroine, since it operates according to Ohm's acoustic law, stipulating that sound can only be perceived if there is an equivalence in power and frequency. Jane the narrator is a powerful listener with an inherent moral nobility, able to hear keenly people even if they far exceed her in status, even if what she hears reinforces her social inferiority. They, however, cannot hear her, as she is for the bulk of the novel perceived to be operating on an inferior frequency, both socially and sonically. Jane is always out of sync with Brontë's sonic fictional world, only achieving an equivalence in frequency with Mr. Rochester when he himself becomes profoundly disabled. As such, Jane's nature reveals to us that the world Brontë has built is one where resonance can only be achieved with dramatic reversals of status, whether they be socioeconomic status or status as disabled/able-bodied.

As a narrator Jane frequently relies upon sonic metaphors in order to convey to her readers a specific and retrospective position—being literally out of hearing. At the beginning of the novel, she articulates her outsider status in these terms: "I was a discord in Gateshead Hall: I

[32] "Desiring Difference: Sympathy and Sensibility in Jane Eyre," *Novel* 37.1 (2003): 112- 134, 131.

was like nobody there; I had nothing in harmony with Mrs. Reed or her children, or her chosen vassalage. […] They were not bound to regard with affection a thing that could not sympathise with one amongst them; a heterogeneous thing."[33] Jane's initial positioning as an unwanted orphan child is articulated both in terms of harmony and resonance and in terms of sonic inequality. Amongst a family that would otherwise share a biological and emotional resonance, Jane is out of key, "a discord," and a threat to their "harmony." Because of her discordant presence, she exists as a "heterogeneous thing"—operating on an entirely different frequency than her adopted family, disabling the sympathy they would have with her if they could resonate together. Brontë posits a world where society is organized according to the rules of acoustic and sympathetic resonance, a world where Jane's discord emphasizes the fact that she has yet to find her place.

Jane's meditation on her discord with the Reed family takes place in the famous "red-room," a site that many critics identify as the nexus of Jane's sensory differences. Her sonic disharmony intensifies to an unbearable level, resulting in a "dreadful noise" which heralds her break from the Reeds. Locked in the "red-room" as punishment after a physical altercation with the elder Reed son, Jane has an out-of-body, or all-too-embodied, auditory experience after she perceives an approaching supernatural danger. She has "a species of fit"[34] which provides Mrs. Reed with enough reason to finally send her to Lowood Institution, where she spends the rest of her childhood. The red room scene has produced multiple critical readings that examine its

[33] *Jane Eyre*, edited by Richard J. Dunn, 3rd ed., New York: W.W. Norton and Co, 2001, 12.
[34] Ibid, 14.

revelation of the narrator's "dangerous double consciousness,"[35] her otherworldly awareness of her own alterity,[36] and the novel's own representations of mind control and madness.[37]

But critics, with the exception of Nandrea, have paid surprisingly little attention to this scene's representation of the interplay between Jane's sense of sight, sound, and her emotions, as well as the fact that it concludes with an ambiguous and highly disturbing sound. As she waits to be released, she ponders the unjustness of the Reed's family's treatment of her and the disharmony produced by her status as a poor relation. Seeing a beam of light pass into the otherwise darkened room, which the narrator attributes retrospectively and rationally to a passing lantern, the child version of Jane perceives the approach of ghost. "[P]repared as my mind was for horror, shaken as my nerves were by agitation, I thought the swift darting beam was a herald of some coming vision from another world. My heart beat thick, my head grew hot; a sound filled my ears, which I deemed the rushing of wings; something seemed near me."[38] Jane's body and mind, conditioned by the hostility of the Reed family, are ready to conduct her "horror" and "agitation" via her nerves, sparked by the beam of light. As she responds physically to this external, visual stimulus, "my heart beat thick, my head grew hot," and she also begins to hear things, "the rushing of wings," which she perceives as all too close to her. Nandrea observes that "the entire scene is legible in terms of a chain reaction of sensory excitations."[39]This chain of biological and psychological responses is what precipitates her "fit"—the exchange of sight for

[35] Sandra M. Gilbert and Susan Gubar*, The Madwoman in the Attic*, New Haven: Yale University Press, 1979, 343.
[36] Nadrea, ""Desiring Difference: Sympathy and Sensibility in Jane Eyre."
[37] See Judith Leggatt and Christopher Parks, "From the Red Room to Rochester's Haircut: Mind Control in Jane Eyre," *English Studies in Canada* 32.4 (2006): 169-188, and Clare Boylan's 'The Secret Diary of Mrs. Rochester': Between Red Rooms and Yellow Wallpapers," *Studi Irlandesi*, 3 (2013): 293.
[38] *Jane Eyre*, 14.
[39] "Desiring Difference: Sympathy and Sensibility in *Jane Eyre*," 12.

emotional turmoil, and the resulting physical manifestation of a strange sort of hearing. She produces an uncanny noise, which the narrator remarkably does not describe but instead portrays through the dialog of the female servants: "Miss Eyre, are you ill?" said Bessie. "What a dreadful noise! it went quite through me!" exclaimed Abbot.[40] The noise that she formerly perceived as "fill[ing] her ears" is ambiguous—either her own scream, or her auditory hallucination. The only people, including her own self, who are able to identify the source of the sound as Jane are the servants who overhear her. Her aunt, making no mention of hearing such a scream, admonishes the servants as one pleads, "Miss Jane screamed so loud, ma'am," and locks Jane back in the room, whereupon she falls unconscious.

That the two female servants, Bessie and Abbot, are able to hear and sympathize with Jane's cry from within the red room, reveals that these characters operate on the same sonic and emotional frequency as Jane, as well as occupying the same social status. Jane herself seems unaware that she has made a sound that has resonated so effectively with the servants, who provide the only record, through their dialog, that her scream actually occurred. This record is essential to show that her scream is a(n) (other) worldly, rather than merely subjective, event. Abbot exclaims that the sound "went quite through me," indicating her bodily conduction of Jane's sonic frequency, but which does not end in resonance or emotional sympathy. It is the other female servant, Bessie, who has greater sympathy for Jane, who sings to her and comforts her.[41] Jane's auditory hallucination, and the scream heard by Abbot and Bessie, indicate a particular auditory timbre that is Jane's discord within the elevated harmony of the Reed

[40] *Jane Eyre*, 14.

[41] The narrator remarks that Bessie's singing has a particular quality to it, a sweetness that changes to sorrow depending on Jane's emotional state as she listens: "I had often heard the song before, and always with lively delight; for Bessie had a sweet voice,—at least, I thought so. But now, though her voice was still sweet, I found in its melody an indescribable sadness," 17.

household. The fact that her noise, in a moment of great emotional distress, is only perceivable by servants, only one of whom sympathizes emotionally with her, is an indication of her own status in the home, as lower even than a poor relation, and equal to that only of the most sympathetic, female servant. Her "species of fit," then, may well be born of the realization that she does have a sympathetic sound frequency within the house, but only on a level that initially demeans her. Such a lowering of status, expressed in Brontë's exploration of sound and sympathy, foregrounds Jane's later work as a governess, again ambiguously positioned between family and servant.

The red room scene is the earliest expression of Jane's unique sonic frequency, an examination of how her "discord" produces specific sympathetic resonances across the novel, which simultaneously lower and heighten the character's social and subjective status. Part of this discord, as Nandrea argues, is the disconnection between Jane, the speaker of the novel, and the former self whom she narrates.[42] But far from being an undesirable quality, Jane's unharmonious subjectivity is not only, as Nandrea indicates, "an unintended failure or necessary error that reveals the impossibility of achieving a unified identity." Indeed, it is also possible to read in her identity "the desire to repeat an experience of discord, an experience of sensory variation and intensity."[43] Here, Nandrea's observation about Brontë's decision to endow her main character with a desirable sensory alterity, which is repeated throughout the text, is to me an indication that that the novel also commits to the rhythms of an altered sense of hearing, and to a unique sense of the intertwined relationship between sympathy and sound, a relationship that reveals the contours of Brontë's sonic world building.

[42] 123.
[43] 122.

In addition to embracing alterity, Brontë's sympathetic soundscape is also gendered and transgressive, invested in the subjective potential that sound carries for her female narrator. Sound is frequently a disruption in the text, rebelling against the enforced quiet of authority, while also creating resonances between female characters. Where there should be silence there is sound, often loud and disrupting: young Jane cries out in terror in the dark, quiet red-room, Helen Burns announces her presence with a "hollow cough" in the imposed silence of the Lowood Institute (41)[44], and Bertha Mason interrupts Jane's slumbers at Thornfield Hall with "a step creak, a […] snarling, canine noise, and a deep human groan" (179). Jane's particular hearing, sensitive to others that operate on her frequency, picks up on subtle signals throughout the text—her own discord with the Reed's, Helen's impending death, and Bertha's presence. Brontë places a great deal of emphasis on the particulars of her female characters' hearing, using them to stratify different subjective experiences of sound, and characterizing Jane's comparative super-hearing through her audible perception of otherwise silent information. Jane's unique hearing allows her to map out the sonic world in which she exists.

Her extraordinary hearing ability, which comes into particular good use at Thornfield Hall, is highlighted by Mrs. Fairfax's deafness, as a household managed under a deaf woman presents a particular hazard given Bertha's surprisingly frequent escapes. Mrs. Fairfax admits to Jane, "I am a little deaf."[45] Her deafness offsets Jane's hearing even more, perhaps in order to differentiate the status of two female employees (housekeeper and governess) who would be the

[44] When Helen Burns and Jane first meet, she observes her future friend reading a copy of *Rasselas*, and Jane recalls that their shared preference for reading "touched a chord of sympathy somewhere" (41). Again using a musical, aural metaphor to communicate Jane's resonance with another female character, Brontë characterization of their beginning friendship indicates shared social status as well as a heightened empathetic response between the characters as well as between the reader and the text, heightened even more so by Helen's death.

[45] 84.

medium between servant and household. Including a deaf woman on the novel's spectrum of hearing also allows Brontë to heighten her readers' sense of her heroine's comparative super-ability, and illustrates that super-ability's dependence on deafness in order to be fully legible to a reading audience. As a deaf character, Mrs. Fairfax adds another coordinate to Jane's map of her sonic world.

Jane's super-hearing also becomes legible to us when she overhears the madwoman, audibly perceiving "a vague murmur, peculiar and lugubrious."[46] Her ears are so sensitive that she can perceive Bertha's otherwise imperceptible touch on the outside of her door, "as if fingers had swept the panels in groping a way along the dark gallery outside."[47] But Jane's ability to audibly perceive Bertha does more than just save Mr. Rochester from being burned alive in his bed; it suggests a peculiar resonance between these characters, as only she can sense her and attribute her noisemaking accurately. Jane and Bertha operate on the same sonic wavelength, suggesting symbiotic relationship between their forms of alterity, Jane's sonic discord and Bertha's madness, designating them as coexisting within the same sonic world. Whereas many readings of this novel create oppositions between these two characters, exposing the colonialist, racist, and ableist logic that Brontë follows consistently throughout her writing, a sonic reading of the novel exposes their deep and troubling resonance with one another.[48]

[46] 130.
[47] Ibid.
[48] The twinning of Jane and Bertha is well-known staple of second-wave feminist literary criticism. Sandra Gilbert and Susan Gubar argue that "on a figurative and psychological level it seems suspiciously clear that the specter of Bertha is still another—indeed the most threatening—avatar of Jane" (*The Madwoman in the Attic: The Woman Writer and the Nineteenth-Century Literary Imagination* (1979), New Haven: Yale University Press, 1984, 359). Gilbert and Gubar's focus on "the madwoman in the attic" speaks more broadly to second-wave feminism's uncritical reliance on representations of women's disabilities—particularly mental illness—as theoretical concepts. For the postcolonial interpretation of the Jane/Bertha twinning, I refer to Gayatri Spivak's famous reading of *Jane Eyre* where she argues that the

Of course, like young Jane's resonance with the female servants in the Reed household, her aural connection with Bertha is also potentially threatening and demeaning to a main female character whom Brontë's novel seeks to elevate.[49] Ultimately, the most valuable resonance is between Jane and Rochester, an across-the-tracks romance naturalized in Brontë's sonic world, and Jane the narrator is far more explicit about the sympathy between herself and her future husband. Upon first meeting him after he falls off his horse, she reflects on his physical imperfection, telling her readers that if he had the qualities of "a handsome, heroic-looking young gentleman […] I should have known instinctively that they neither had nor could have sympathy with anything in me, and should have shunned them as one would fire, lightning, or anything else that is bright but antipathetic."[50] Remarkably, her sympathy with the flawed Rochester is structured around her unsympathetic response to conventional forms of beauty, indicating her conscious decision to operate on an aesthetic frequency that resists physical conformity. Brontë's representation of her characters' mutual attraction creates a counterintuitive discord between what may be her readers' more conventional and generic expectations of a romance, which may rely upon visual, aesthetic cues.[51] It is "off the map" of the traditional bildungsroman, but it marks the center of Brontë's sensory world. Jane explicitly rejects the elemental counterparts of heroic masculine beauty, "fire" and "lightning" as being inherently

heroine's position at the novel's narrative center depends completely on Bertha's marginalized, mentally ill, and implicitly racialized status. This reading disproves the notion of a "global sisterhood" that supposedly united Victorian women with their colonial counterparts, ("Three Women's Texts and a Critique of Imperialism," 1985, 128).

[49] Just as Mrs. Fairfax's deafness heightens the reader's sense of Jane's super hearing, so too does Bertha's madness increase our sense of Jane's psychological control and intelligence.

[50] Ibid, 97.

[51] In the preface to the second edition (1847) Brontë, writing as Currer Bell, admonishes her doubting readers against criticizing her novel for its lack of conventionality, telling those "whose ears detect in each protest against bigotry—that parent of crime—an insult to piety" that "Conventionality is not morality," 1.

"antipathetic." In doing so, she indicates that from their first acquaintance she and Mr. Rochester are in synch on a deeper, aural level than the visual and superficial.

"Sympathy" becomes the key word of the courtship between Jane and Mr. Rochester, as he observes that they have in common the ability, not "to tell of yourself, but to listen while others talk of themselves […] with a kind of innate sympathy."[52] Like Jane, Rochester characterizes his own sympathy as linked intrinsically with the act of listening and not speaking, a remarkable refusal on Brontë's part to value the creative potential of voicing over hearing, or an ironic reference to the fact that the entire novel is in fact Jane's telling of herself. Even when not associated explicitly with sound and hearing, sympathy still retains a sense of the natural yet unseen, audible world in the context of their attraction to one another, as Rochester attributes Jane's ability to save him from being burned alive by Bertha not to her extraordinary aurality, but to their "natural sympathies."[53]

As her two main characters continue their dramatic courtship of one another, Brontë expands her narrative sense of sympathy to include its otherworldly and therefore speculative properties, opening up a larger interpretive space outside of Jane's interiority where sound and sympathy can be explored further. Jane's characterization of her own sympathetic resonances changes midway through the novel. She picks up Rochester's definition of the "natural" yet magically inexplicable sympathy between them, developing a larger definition for her readers to share. "Sympathies, I believe, exist (for instance, between far-distant, long-absent, wholly estranged relatives asserting, notwithstanding their alienation, the unity of the source to which each traces his origin) whose workings baffle mortal comprehension. And signs, for aught we

[52] 116.
[53] 129.

know, may be but the sympathies of Nature with man."[54] Such an assertion of shared, intrinsic "origin" between "relatives" shares a common language with later evolutionary theory, although it interprets these relationships very differently. Brontë uses this speculative mode to emphasize a common origin in those who feel sympathy for one another even in a state of alienation. The author establishes implicitly that ideas of origin and connection are prerequisites for a shared humanity, rather than providing a proto-eugenic model of biological improvement and superiority. In other words, whereas evolutionary theorists like Darwin would have us trace back our humanity to "the origin of species" looking backwards along the "descent of man," Brontë's speculative fiction seeks to reveal the origin of sympathies, all the while projecting into the future the potential viability of femininity and disability. Via her main character, Brontë makes bold assertions not only about the nature of the fictional world she is building, but also about the invisible, inner workings of the natural world, which "for aught we know" contains the invisible sound waves, magnetic fields, and electric impulses whose binding threads connect human beings in a horizontal network, rather than in a hierarchical lineage.[55] Her speculations about the nature of human communication—whether via sound or sympathy or both working in relation to one another—emphasizes the potential flexibility and unpredictability of connections across social positions and abilities, rather than falling into line with later, Darwinian assertions about linear, familial succession.[56]

All of this, the exceptional, dynamic sympathy shared between Rochester and Jane,

[54] 187.
[55] Brontë had to have at least some familiarity with the Michael Faraday's research in electricity and magnetic fields, published in the 1830s. After Jane is granted a week's leave from Thornfield, she characterizes her return as if drawn by an invisible force: "no magnet drew me to a given point, increasing in its strength of attraction the nearer I came" (206).

Jane's super-hearing and resonance with others, and Brontë's speculations on her historical, scientific contemporaries' discoveries about the natural world, comes to fruition in the scene where Jane, estranged from her former fiancé, hears Rochester call her name from Thornfield Hall, a vast distance away.

> My heart beat fast and thick: I heard its throb. Suddenly it stood still to an inexpressible feeling that thrilled it through, and passed at once to my head and extremities. The feeling was not like an electric shock, but it was quite as sharp, as strange, as startling: it acted on my senses as if their utmost activity hitherto had been but torpor, from which they were now summoned and forced to wake. […] "Jane! Jane! Jane!"— nothing more. "O God! what is it?" I gasped. I might have said, "Where is it?" for it did not seem in the room—nor in the house—nor in the garden; it did not come out of the air—nor from under the earth—nor from overhead. I had heard it—where, or whence, forever impossible to know! And it was the voice of a human being—a known, loved, well-remembered voice—that of Edward Fairfax Rochester; and it spoke in pain and woe, wildly, eerily, urgently. "I am coming!" I cried. "Wait for me! Oh, I will come!"[57]

A callback to the red room scene, where "My heart beat thick, my head grew hot; a sound filled my ears,"[58] this passage advances and revises Jane's aurality and tunes it into a viable tool for mapping the sonic world built by Brontë, a speculative world that – as it were – announces the future capabilities of sound. Unlike the much younger Jane, whose speculation that her aural hallucinations might be the product of a ghostly presence—her dead uncle—the adult Jane

[57] 357-358.
[58] 14.

asserts, "Down superstition! […] This is not thy deception, nor thy witchcraft: it is the work of nature. She was roused, and did—no miracle—but her best."[59] As one critic points out, what is at stake here is not the suspension of the novel's otherwise investment in literary realism,[60] but a reinforcement of Jane's "unwavering faith in the extraordinary range of natural phenomena."[61] Indeed, all of the effects of this fictional auditory event could be explained by the scientific discourse of Brontë's own time. The sound beats within her own body, as it resonates with a voice and sensibility that is in perfect sync with Jane's. Mr. Rochester's voice is conducted through their mutual auditory sympathy, in perfect keeping with theories of sound and acoustics produced earlier in the 18th and 19th centuries. Remarkably, Brontë takes these theories a step further in conveying, however ambiguously, that sound could travel via an "electric shock," a premonition of the telephone's future existence. Jane's futurity resides in her intuitive understanding of the concept of telecommunication – of speaking at a distance – before the technology for such an exchange existed.[62]

Jane's act of futuristic, sonic mediation is as predictive of the future as it is indicative of the novel's contemporary significance. As Richard Menke points out, this scene could have very

[59] 358.
[60] Srdjan Smajić disagrees with Terry Eagleton's influential interpretation of this scene, which the latter critic cites as evidence for "how realism can selectively borrow from 'less realist forms'" as a way of resolving "genuine social problems" that present narrative obstacles for realist novels. *The English Novel*, Maiden: Blackwell: 2005, 141-142, cited in "Supernatural Realism."
[61] Smajić, 15.
[62] Earlier forms of the technology, however, were already fairly well-established. Melissa Dickson argues that Brontë may have been influenced Charles Wheatstone's 1821 exhibition of an acoustic device called "Enchanted Lyre," which allowed sound to travel to travel limited distances along conductive metal wires. His contemporaries also referred to the device as a telephone (*Sound Knowledge: Music and Science in London, 1789*-1851, ed. James Q. Davies and Ellen Lockhart, Chicago: Chicago University Press, 2016, 140-142). In 1845, two years before the publication of *Jane Eyre*, Wheatstone established the Electric Telegraph Company with his partner William Fothergill Cook.

well been inspired by the first forays into the telegraph system, by the "the electric messages just beginning to reach public consciousness in the 1840s."[63] Menke also makes the observation of Rochester's call to Jane is a proto telephone call, saying that "the words of Alexander Graham Bell's impromptu first telephone call to his assistant—'Come here, I want you'— could have been spoken by Rochester."[64] But however easy it is for critics to make the connection between Brontë's novel and Bell's future invention, it was not easy for her contemporary readers to take in the full extent of Jane's extraordinary hearing ability. One reviewer harped on the scene, declaring that "This supernatural call, heard by her at the distance of at least fifty miles, is the only objectionable thing, in our estimation, to be found in the work […] The mere force of sympathy could not produce such a result. Imagination inwardly, and mesmerism from outside influences, may do great feats, no doubt, and cause people to believe anything; but the voice has not got a telegraphic communication direct to the ear at fifty miles distance."[65]

This remarkable review stands out to me in its perfect willingness to value Brontë as a female author, but not for her seemingly unrealistic anticipation of a great scientific discovery. But even in its critique, it finds the heart of the novel's innovation, which is that sympathy could indeed "produce such a result" of aurally connecting two people across a vast distance. Some twenty years after *Jane Eyre* was published, Hermann Von Helmholtz published *Die Lehre vo den Tonempfindungen als pysciologische Grundlage für die Theorie der Musik* (1863), later translated as *On the Sensations of Tone as a Physiological Basis for the Theory of Music* (1875).

63 *Telegraphic Realism: Victorian Fiction and Other Information Systems*, Stanford: Stanford University Press, 2008, 78.
64 Ibid, 82. This reading also genders this scene and situates its innovation with Bell, Watson, and Rochester rather than with Brontë and her titular character.
65 George Troup, "Literary Register," *Tait's Edinburgh Magazine* (1848), 348. Cited in *Telegraphic Realism*, 80.

In it, Helmholtz further developed the theory of sympathetic vibration, and devised a system by which tones could be mechanically reproduced via tuning forks operated electromagnetically.[66] Key to Helmholtz's new electromagnetic acoustical system was the understanding that "each single simple tone […] can be separated from the composite mass of tones, by mechanical means, namely by bodies which will vibrate sympathetically with it."[67] The ability to separate out tones from one another by identifying specific, sympathetic vibrations was the basis for Alexander Graham Bell's preliminary foray into developing the telephone. He reproduced Helmholtz's original experiment, and from there continued to experiment electronically with different ways of conveying tones until he could convey the human voice along a wire previously designed only for telegraphic signals.[68] Brontë's own literary experiment with sonic capabilities of sympathy, allowing her characters to call one another over a mutually shared wavelength, was indeed within the bounds of scientific capability. In literary form, she was able to realize a technological method of communication not possible for another 30 years.

The prophetic telephone call between Jane and Rochester also creates an inclusive, new space for the novel's heroine within her built world, an accommodation of Brontë's version of an intellectually elevated and socially ideal place for a woman. By mapping the contours of the sonic world that Brontë builds in *Jane Eyre*, she reveals the alternative networks of sympathy and affinity, allowing her characters to resonate sympathetically with one another across an implausible distance. This allows Brontë to break the rules of the traditional marriage plot and

[66] Michael E. Gorman and W. Bernard Carlson, "Interpreting Invention as a Cognitive Process: The Case of Alexander Graham Bell, Thomas Edison, and the Telephone," *Science, Technology, and Human Values*, 15.2 (1990): 131-164, 137.
[67] *On the Sensations of Tone as a Physiological Basis for the Theory of Music* (1875), Trans. Alexander Ellis, London: Longman, Green, and Co., Third Edition, 1895, 48.
[68] *Scientific American*, 102.23 (1910), 462, 470-471, 462.

allows her heroine to grow beyond her expected role. Instead of resolving her bildungsroman by fulfilling the growth and elevation of her heroine with a purely socially advantageous marriage – instead of calquing the evolutionary hierarchies of lineage and inheritance – Brontë instead enfolds Jane and Rochester in the sonic and electromagnetic network she places on the horizon of the future, thus recreating them as equals. Indeed, their entry into this egalitarian network concludes Brontë condemnation of the hierarchical structures of class and breeding. The catalyst for Rochester's call is the fire at Thornfield Hall, which Bertha sets and that kills her. The fire destroys simultaneously Rochester's house and first marriage, severing his connection to more troubling indicators of wealth—his manor house, where he formerly hosted a cast of immoral, upper-class characters, and Bertha Mason, who linked Rochester to the slave trade. Brontë neutralizes these economic and human immoralities[69] at the same time as Jane receives an inheritance from her uncle, effectively raising her socioeconomic status at the same time as Rochester is lowered. Their marriage is no longer a social necessity but is rather Jane's independent decision—a narrative decision on Brontë's part that only comes about after she connects her characters through their call, implying a possible relationship of cause and effect between the sonic event and the social ones.

Jane Eyre's Disabled Futurity

Equalizing Jane and Rochester also depends on the acquisition and embrace of disability at the conclusion of the bildungsroman. Their resonance with one another only reaches its full potential when Rochester himself becomes disabled, and when disability therefore reaches its full potential as a foundational element in the built world of the novel. He recollects to Jane that

[69] That is to say Brontë condemns slavery in a manner typical of 19th-century abolitionists, and not in terms of a more nuanced understanding of racial justice.

he called out to her while recovering from the recent loss of his hand and his vision in the fire, confessing that he prayed not for relief from his injuries, but for her presence: "I pleaded; and the alpha and omega of my heart's wishes broke involuntarily from my lips in the words—'Jane! Jane! Jane!"[70] In response, he recalls hearing "a voice—I cannot tell whence the voice came, but I know whose voice it was—replied, 'I am coming: wait for me;' and a moment after, went whispering on the wind the words—'Where are you?'"[71] At once acknowledging the impossibility of hearing Jane's voice given their geographical separation, while also being certain that it was her voice that he heard, he details the sonic conditions that forbid such an event from feasibly taking place: "Ferndean is buried, as you see, in a heavy wood, where sound falls dull, and dies unreverberating. 'Where are you?' seemed spoken amongst mountains; for I heard a hill-sent echo repeat the words." Rochester initiates the call from a place that negates sound, a sonic vacuum where he himself is isolated and newly disabled, echoing the Romanticist theory of resonance that necessitates a position of deafness or blindness, or a philosopher that sits "in darkness and silence."[72] The fact that Jane's voice resonates so clearly back to him despite all this presents two different, complimentary scenarios. According to the sonic logic of the novel, Rochester's aurality has acquired a new alterity that resonates even more strongly with that of Jane, just as she did formerly with female servants and with Bertha. At the same time, it could also read that Jane's super-hearing transcends the limitations of the novel's fictional, yet naturally portrayed landscapes, building its own geographic possibilities and dismantling the perceived limits of sound.

Brontë's return to this scene, where the reader is granted a replay of the call from

[70] 381.
[71] Ibid.
[72] *Entrentien entre d'Alembert et Diderot* (1769).

Rochester's perspective, is key in understanding how the intersection of disability, gender, and anticipatory science fiction ultimately plays out in the bildungsroman. Jane is quick to question Rochester about the concrete details of his call, asking him pointedly, "And it was last Monday night, somewhere near midnight?"[73] in order to confirm, in measurable terms, that the phenomenon was at least a shared, real occurrence that took place on a temporal plane. Jane the narrator is reluctant, however, to fully characterize or explain the call beyond this measurement, emphasizing that "The coincidence struck me as too awful and inexplicable to be communicated or discussed. If I told anything, my tale would be such as must necessarily make a profound impression on the mind of my hearer: and that mind, yet from its sufferings too prone to gloom, needed not the deeper shade of the supernatural."[74] Thus instructed, the narrator's "hearer" can draw the conclusion that the call takes place in the natural, not supernatural world, enabled by the characters' sympathetic resonance with one another, one that the reader perhaps shares with the author. Brontë creates a romance of gender equality through this call, the conditions for which are created by the characters' shared sensory differences and disabilities which come to define the novel's conclusion.

The last chapter, which focuses on Jane and Rochester's married life in the context of his acquired disabilities not only signals the most recognizable outcome of their romance ("Reader, I married him"), but also reveals a futuristic narrative about disability, caretaking, and accommodation. As D. Christopher Gabbard observes, *Jane Eyre* contains two narratives of disability caretaking, one where Rochester secretly imprisons his mentally ill wife, Bertha, and

[73] Ibid.
[74] Ibid.

one where Jane accommodates Rochester's disabilities.[75] According to Gabbard, the first example of disability caretaking serves as an example of outdated treatment of the mentally ill, whereas Jane's accommodation of her Rochester's acquired disabilities, mainly his blindness, represents a reform.[76] In this interpretation, the novel presents a linear evolution of Jane's attitudes towards disability from revulsion to acceptance, from her fear of Bertha to her embrace of her newly disabled husband. But I would argue that this interpretation flattens both the novel's approach to disability and its temporality. Gabbard is correct to point out that Jane's eagerness to fulfill the role of caretaker to a disabled person is at odds with Bertha's mistreatment, but given the novel's emphasis on sound, hearing, and communication, there is a finer distinction to made about Brontë's attitudes towards specific disabilities. Brontë contrasts a more general, negative attitude toward all disabilities, mental and physical, with Jane's clear condemnation of madness over physical impairment. She clarifies this position when a servant condemns Rochester's injuries in the fire as unlivable ("he is alive; but many think he had better be dead […] He is now helpless, indeed—blind and a cripple"),[77] and Jane the narrator expresses her relief: "I had dreaded worse. I had dreaded he was mad."[78] Such a distinction between madness and physical or sensory disability reveals that Jane the narrator's attitudes toward disability are in fact more fixed than evolving, and that there are limits to which disabilities Brontë is willing to sustain within her fictional world.

However, because Jane-the-narrator is always speaking from a future position, recalling

[75] "From Custodial Care to Caring Labor: The Discourse of Who Cares in *Jane Eyre*," in *The Madwoman and the Blindman:* Jane Eyre*, Discourse, Disability*, ed. David Bolt, Julia Miele Rodas, and Elizabeth J. Donaldson, Colombus: Ohio State University Press, 2012, 91-110.
[76] Ibid, 110.
[77] 365.
[78] Ibid.

the narrative of her development to her readers, her preference for Mr. Rochester's newfound disabilities over Bertha's madness belongs in the future world of the novel, and is not part of her evolution as a character. She speaks the entirety of her narrative not from the current moment of the events she recalls, but from a position where "I have now been married ten years,"[79] and where she has accommodated continually her husband's disabilities: "never did I weary of gazing on his behalf […] never did I weary of conducting him where he wished to go […] there was a pleasure in my services, most full, most exquisite, even though sad—because he claimed these services without painful shame or damping humiliation."[80] Her future accommodation of her husband celebrates the lack of "shame" and "humiliation" of his dependency on his wife, and her "pleasure" in acting as caretaker. The futurity of *Jane Eyre*, then, acts in a speculative mode that conserves physical disability or builds it into a fictional world, a world where "[t]he persistent forms of human biodiversity we consider disabilities witness sturdiness more than fragility, interdependence more than isolation."[81] In the end, Jane's marriage to Rochester is a fictional representation of some of the tenants of inclusive world building. In developing the sonic world of her heroine, a world where the anticipation of communicative technologies succeeds in connecting together the super-hearing Jane with the newly disabled Rochester, Brontë also builds a world where physical disability is sustainable and accommodation is celebrated.

Sonic and Evolutionary Theory in *The Mill on the Floss*

[79] 383.
[80] 384.
[81] Garland-Thomson, 141.

George Eliot's *The Mill on the Floss* (1860) is a fictional speculation about the dialog between Romanticist and mid 19th-century sonic theories and newly emergent evolutionary theory. As many critics have noted, Eliot's body of work engages in a thorough, critical examination of the evolutionary theories of Herbert Spencer[82] and Charles Darwin, and the connection between Eliot's writing and her active involvement with her contemporary scientific community has created a rich field of literary study.[83] Many scholars have sought not only to understand how these theories became instrumental in how she imagined her fictional worlds, but also how her fictional worlds functioned as critical examinations of these very same theories. In the particular case of *The Mill on the Floss*, Nancy Paxton examines how Eliot's close, personal involvement with Herbert Spencer shaped both her authorship and her creation of her novel. Prior to and during the novel's composition, Spencer played a key role in "unmasking"[84] George Eliot, revealing her to be Mary Anne Evans, and thus making her gender "a serious liability which would determine the critical reception of *The Mill on the Floss* and subsequent novels."[85] As a result, Eliot's narrative about the contrasting childhoods of Tom and Maggie Tulliver parodies Spencer's influential essays on biologically-informed education,[86] poking fun at his misogyny.[87] By 1859, however, Eliot's reading of Charles Darwin's *On the Origin of*

[82] Herbert Spencer wrote on evolutionary theory and biology prior to Charles Darwin, and played a key role interpreting and popularizing the latter's work. Spencer coined the term "survival of the fittest" after reading *On the Origins of Species,* and is also credited with developing the concept of social Darwinism.
[83] See Sally Shuttleworth, Nancy Paxton, Gillian Beer, and more recently Ian Duncan.
[84] *George Eliot and Herbert Spencer: Feminism, Evolutionism, and the Reconstruction of Gender,* Princeton: Princeton University Press, 1991, 70.
[85] Ibid, 69.
[86] Eliot singles out in particular Spencer's "The Moral Discipline of Children" (1858), Ibid, 75.
[87] "*The Mill on the Floss* shows finally that she, in contrast to Spencer, saw sex differences not only as determined by biological function but also as constructed by profoundly misogynist cultural traditions and ideologies," Ibid, 71.

Species had renewed and strengthened her interest in evolutionary theory in relation to gender.[88] Her novel is an examination of these theories both in terms of her heroine's place within her fictional world her own position as a newly unmasked female author.

In regards to sound, her authorial position echoes Diderot's Romanticist theory of resonance, whereby sonic vibration continues to resonate indefinitely across multiple strings, "without our being able to set a limit to the ideas that are aroused and landed in a philosopher who meditates or who listens to himself in silence and darkness."[89] As a woman author, Eliot took a similar position of deafness or sensory deprivation when it came to imagining her relationship with her writing, particularly in the context of her reading public who was newly aware of her identity as she wrote *The Mill on the Floss*. Kyriaki Hadjiafxendi finds that Eliot assumed a position of authorial deafness when faced with the acclaim she received after the publication of *Adam Bede* (1859), alongside the revelation of her gender, remarking to her publisher that "It comes rather strangely to me, who lives in such unconsciousness of what is going on in the world. I am like a deaf person, to whom someone has just shouted that the company around him have been paying him compliments for the last hour."[90] Her reference to deafness as a woman author[91] who cannot hear her reading public has several possible motivations, one being her inability to engage with publicity with the same ease a male author

[88] Ibid, 71.
[89] *Entrentien entre d'Alembert et Diderot* (1769), in Denis Diderot, *Oeuvres*, Paris: Gallimard, 1951, 876. Quoted and translated in Veit Erlmann's *Reason and Resonance: A History of Modern Aurality*, New York: Zone Books, 2014, 9.
[90] *The George Eliot Letters*, ed. Gordon S. Haight, 9 vols (New Haven and London: Yale University Press, 1954-79), III, 43. Cited in "Between Deafness and Sound: Aurality and the Limits of Sympathy in Geoge Eliot's The Mill on the Floss," *The George Eliot Review*, 42 (2011): 79.

[91] Her appropriation of deafness as a woman author also recalls her literary kinship with Harriet Martineau.

operating without a pseudonym was able to do,[92] and one being a proud admission of "unconsciousness" while writing. It seems that for Eliot, similar to Diderot, the position of "a philosopher who listens to himself in silence and darkness" was a necessary ingredient for the creative reception of resonating ideas. Deafness, then, creates the space in which a woman author like Eliot can feasibly exist and create, where none might exist otherwise.

She, more so than Brontë, was writing during a time where the scientific community was exploring avidly the possibilities of aural experiences. As Kyriaki Hadjiafxendi observes in her examination of sound and sympathy in *The Mill on the Floss,* Eliot benefitted from a thorough exploration of sensation, physiology, and sound that intensified in the 1850s, "ranging from Alexander Bain's *The Senses and the Intellect* (1855) and Hermann von Helmholtz's *The Sensations of Tone* (1856) to Herbert Spencer's 'The Origin and Function of Music' (1857) and George Henry Lewes's *The Physiology of Common Life* (1859)."[93] Indeed, scientific studies of sound began to replace a previous emphasis on vision, as Gillian Beer argues when she observes that "in Helmholtz's view the ear was a much finer and more competent organ than the eye. Sound began to assume the status as ideal function that sight had earlier held."[94] Eliot's involvement in the mid nineteenth-century refocus on sound has been the subject of a great deal of scholarly attention. Multiple critics have recognized the significance of musical theory in her work, often linked to emergent theories of evolution, psychology, and sociology,[95] but only

[92] Multiple scholars have examined Eliot's authorial persona in relation to her voice as a female writer (cite Hadjiafxendi, Paxton, Beer, pg. 80 in "Limits of Sympathy")

[93] "Between Deafness and Sound," 78.

[94] "'Authentic Tidings of Invisible Things': Vision and the Invisible in the Later Nineteenth Century," *Vision in Context: Historical and Contemporary Perspectives on Sight*, ed. Teresa Brennan and Martin Jay. New York: Routledge, 1996, 85-98; p. 91.

[95] See Gillian Beer, *Darwin's Plots Evolutionary Narrative in Darwin, George Eliot, and Nineteenth-Century Fiction* Cambridge: Cambridge University Press, 1983; Sally Shuttleworth,

recently have they paid attention to her perspective on sound and sound technology. John Picker, for example, argues that the contemporary setting of her novels "acknowledges at once the frustrating challenges and newly charged power of contact in an age heralding amplified sounds, wired voices, and bottled talk."[96] Rather than anticipating influential and revolutionary sound technology, Eliot's characters exist within those technologies' possibilities, allowing the author to reflect critically upon the sound theory of her day in order to find both its potential and limitations within her fictional worlds.

Eliot's "Great Curtain of Sound"

The opening of *Mill on the Floss*, for example, stages Eliot's novel as a sonic experiment in fiction: "The rush of the water and the booming of the mill bring a dreamy deafness which seems to heighten the peacefulness of the scene. They are like a great curtain of sound, shutting one out from the world beyond."[97] The narrator's description of the landscape echoes Eliot's own self-characterization as an author deaf to her reading public, or enveloped in an unconsciousness of the world outside of her own writing. The sound of the mill creates a narrative space that is implicitly permissive of deafness, which does not mute but "heighten[s]

George Eliot and Nineteenth-Century Science: the Make-Believe of a Beginning, Cambridge: Cambridge University Press, 1984; Nancy L. Paxton, *George Eliot and Herbert Spencer: Feminism, Evolutionism, and the Reconstruction of Gender*, Princeton: Princeton University Press, 1991; Delia da Sousa Correa, *George Eliot, Music and Victorian*, Basingstoke: Palgrave Macmillan, 2003; and Ian Duncan, *Human Forms: the Novel in the Age of Evolution*, Princeton: Princeton University Press, 2019.

[96] *Victorian Soundscapes*, Oxford: Oxford University Press, 2003, 83.

[97] George Eliot, *The Mill on the Floss* (1860), eds. Gordon Haight and Juliette Atkinson, Oxford: Oxford University Press, 2015, 8. Natural water features like rivers and streams are a common metaphor for sound and voicing in Eliot's work, an allusion to William Wordsworth's poetic descriptions of aurality, particularly "On the Power of Sound" (Karen B. Mann, "George Eliot and Wordsworth: The Power of Sound and the Power of Mind," *Studies in English Literature, 1500-1900*, 20.4 (1980): 675-694, 678).

the peacefulness of scene," creating a fiction that relies on a disability metaphor as an essential ingredient for its world building. Disability marks the built world of the novel at its outset, creating the very limit that delineates between the extra-diegetic world of the readers and the anticipatory, fictional world they have just entered. Eliot also sets up an unusual relationship between sound and deafness here, where "deaf" does not signify a lack of hearing, but instead signals an overabundance, "a great curtain of sound," which frames dramatically a specific reading experience that values an altered, selective, or isolating aurality. Thinking back to *Jane Eyre*, where the young Jane similarly retreats behind curtains in order to isolate herself and her reading, *The Mill on the Floss* calls on readers to imagine the world of the novel as containing its own deafening reading experience, enveloped in sound, and functioning as a world contained or outside another world.

But despite these novels' similar behind-the-curtain reading scenes, *The Mill on the Floss* and *Jane Eyre* differ vastly in terms of how their female characters function as sonic experiments in the hands of their authors. The novels' sonic world building is in dialog with one another: whereas Jane's aural abilities—and Bertha and Rochester's disabilities—augment her commanding position within Brontë's fictional universe, Maggie Tulliver's aurality reveals the intentional fragility of Eliot's world building. The later novel has many of the same generic hallmarks of *Jane Eyre*: a misfit heroine whose aurality is out of step with her family's, who struggles for an education that fulfills her intellectually, and who negotiates unsuitable courtships. Unlike the earlier novel, however, where Jane and Rochester's romance centers the narrative, *Mill on the Floss* is about the fundamentally queer, sibling relationship between Maggie and her brother, Tom, whose coming of age is complicated by their family's inability to maintain a stable financial and social future. While *Jane Eyre* starts from an uncertain past and

works towards a knowable future, *Mill on the Floss* reverses this plotline. The latter novel concludes with a flood that wipes out Dorlcote Mill—the defining feature of the narrative landscape—and drowns Maggie and her brother Tom together just as they are reunified after a bitter rift. The river and mill, once working together as a "great curtain of sound" enveloping Maggie's developmental narrative, overflows and becomes an unnavigable, treacherous flood. The novel's tragic ending is an inversion of *Jane Eyre*'s more comic narrative, where Jane's curtained reading space eventually expands to include the entirety of the novel's built world, fully dependent on Jane's sensory perspective. In *Mill on the Floss*, the reality of the heroine's place within her built world is a process of creative elimination rather than integration.

Eliot's gradual disintegration of the stable, sonic landscape she creates at the beginning of her novel plays out in the development of her main character's aurality. She begins by outlining Maggie's origins as their own kind of failed experiment, as her father, in an attempt at proto-eugenic breeding, remarks that he "picked the mother because she wasn't o'er 'cute," lamenting that despite his best efforts in choosing his mate, "when a man's got brains himself, there's no knowing where they'll run to; an' a pleasant sort o' soft woman may go on breeding you stupid lads and 'cute wenches, till it's like as if the world was turned topsy-turvy."[98] Having foiled her father's best proto-Darwinian efforts by being "'cute," or acute in all her senses, Maggie represents a nonlinear outcome in a eugenic trial—a stubborn piece of evidence that the correlation between gender and ability is entirely unpredictable. She embodies evidence that disproves her father's proto-eugenic theories. Her parents perceive her as an evolutionary puzzle, throwing together metaphors of intellectual disability, madness, and racial identity in their attempts to define what she is: "half an idiot," "a Bedlam creatur'," with "brown skin as makes

[98] 19.

her look like a mulatter,"[99] all terms that bring to mind the racialized, mad, and antagonistic Bertha rather than a heroine like Jane Eyre,[100] and which deepen the eugenic tenor of the father's attitudes. Eliot establishes Maggie as an unwieldly central character who does not conform to the same linear, progressive narrative found in more traditional bildungromans like Brontë's earlier novel. Instead, Eliot's heroine occupies a much more precarious position where being out of step with her own family is predictive of her world's eventual collapse. Her fictional world acts as a temporary preserve for Maggie as fragile and unique specimen, rather than acting as the stable yet inhospitable world of *Jane Eyre*, designed to hone the main character's sensory abilities and establish her control over a shared resonance.

Unlike Jane Eyre's hearing which enables her to maintain control over her own narrative, Maggie's acuteness of hearing is not a super-ability, and vacillates instead "between having to listen and not hearing, or speaking and having no one to hear her."[101] Hadjiafxendi argues that this character's "stream of consciousness is shaped within the spectrum of deafness and sound,"[102] much like Eliot's own authorial identity. According to this argument, Maggie is always "out of hearing"[103] of her own family, especially her mother, and struggles to resonate sympathetically with others. I argue that her particular deafness to her mother's surprisingly

[99] 12.
[100] Maggie's racialized characterization, even at this point in the mid 19th century, is a strong indicator of the future association between disability, race, and eugenics, which even now has "real material effects on people located at the intersections of difference." Nirmala Erevelles and Andrea Minear, "Unspeakable Offenses: Untangling Race and Disability in Discourses of Intersectionality," *Journal of Literary & Cultural Disability Studies* 4, no. 2 (2010): 127-143, 134.
[101] Hadjiafxendi, "Between Deafness and Sound: Aurality and the Limits of Sympathy in George Eliot's The Mill on the Floss," *The George Eliot Review*, 42 (2011): 79-80.

[102] Ibid, 79.
[103] 26.

important dialog illuminates the relationship between Maggie's hearing and the fragility of her fictional world. Interwoven into her father's musings on "soft" women and "o'er 'cute" girls, Mrs. Tolliver repeatedly voices her concern about Maggie's unconsciousness of the world around her, saying, "wanderin' up an' down by the water, like a wild thing: she'll tumble in some day."[104] Later, in the first of many admonitions to her daughter, Mrs. Tolliver laments, "where's the use o' my telling you to keep away from the water? You'll tumble in and be drownded some day, an' then you'll be sorry you didn't do as mother told you."[105] Fully aware of her daughter's deafness to her, Mrs. Tolliver's prophetic warning is buried effectively underneath her husband's musings on her "soft" nature, the general repetitiveness and perceived stupidity of her speech, and her dialect, which is arguably more marked by region and class even than her husband's. More than just dialog to be dismissed as characterization or foreshadowing, Mrs. Tolliver's warning to her daughter is an example of Eliot's experimentations with literary aurality. Just as Maggie cannot hear her own mother and fails to grasp the latent dangers of her position in the world, so too do Eliot's readers mishear the direction of the novel's narrative. We dismiss easily the voice of Mrs. Tolliver, who the narrator thoroughly rejects as a non-intellectual woman, and whose "softness"—read in her dialect and the disdain of her husband and daughter—undermines a sharp comprehension of her fictional world. The sonic dynamics of the novel indicate a world "turned topsy-turvy," as Maggie's father observes, where loud voices such as Maggie's are inherently misleading, and where soft voices like Mrs. Tolliver's provide true narrative direction. Eliot guides her readers into an aural experience similar to her heroine's, where we are deafened where we ought to be hearing, and hearing where we ought to be

[104] 12.
[105] 13.

deafened.

Evolution, Destruction, and Disabled Futurity

This disorienting reading experience extends into the Eliot's representation of disability, mainly in the case of Philip Wakem, a "humpback" and childhood friend of Maggie and Tom. Readers receive their first look at this disabled character focalized through three lenses: Maggie's brother Tom, the third-person narrator, and the narrator's speculation of a scientific gaze: "An anatomist—even a mere physiognomist—would have seen that the deformity of Philip's spine was not a congenital hump, but the result of an accident in infancy; but you do not expect from Tom any acquaintance with such distinctions; to him, Philip was simply a humpback."[106] Here, Eliot conveys via her narrator a key distinction about disability that had gained scientific currency by the mid 19th century: that congenital disability— hereditary, insidious, and potentially preventable—was far more threatening than any acquired disability. The scientific, eugenic perspective of the imagined "anatomist" or "physiogomist" modifies Tom's naïve, "soft"-minded interpretation of his schoolmate's disability, which he ascribes to "vague notion that the deformity of Wakem's son had some relation to the lawyer's rascality, of which he had so often heard his father talk with hot emphasis." Tom's reading of the "humpback" combines the eugenic logic of inheritance with a much older idea of disability as a moral punishment, interpreting it as a product of hereditary immorality, no doubt guided by Mr. Tulliver's perception of his children as "topsy-turvy" specimens and by his low moral opinion of the elder Wakem. Philip Wakem, then, as the only character with a visually identifiable physical

[106] 151.

deformity, functions as a way *not* to read disability instead of a main signifier for disability in the novel. He is deliberately misleading, his "humpback" an incidental characteristic, not a hereditary one, and this peculiarity leads Maggie, Tom, and potentially less careful readers, completely astray.[107] Eliot's portrayal of disability once again delineates between her speculative world building and the world of her readers, inviting a critical comparison of her contemporaries' proto-eugenic theories about disability with her characters' misuse of them. By including disability in her world-building, she calls into question the limits of proto-eugenic logic.

The novel pursues this line of questioning as Maggie, Tom, and Philip grow up, and the novel begins to revolve around the Tulliver family's financial and reproductive future, mostly enacted through Maggie's courtships.[108] Eliot's fictional world once again combines the sonic and evolutionary theories of her contemporaries when she illustrates the potential danger of aural resonance combined with Darwinian natural selection. A love quadrangle involving Maggie, her wealthier and more conventional cousin, Lucy, Philip Wakem, and Lucy's suitor, Stephen Guest, engages in various musical flirtations with one another. Here, as Delia da Sousa Correa argues, "Eliot gives an almost Darwinian account of music," drawing from *The Origin of Species* (1859), in which "Darwin describes the use of song by male birds competing for the attention of females, and the female's habitual selection of 'the most melodious or beautiful males.'"[109] I would

[107] Philip Wakem, although exhibiting some disability stereotypes through his bitterness about able-bodied male characters, is also one of the most morally unambiguous and consistent characters in the novel. His love for Maggie, which never comes to fruition, is clear alternative narrative direction that Maggie is never able to take.
[108] Maggie's suitors, Philip Wakem and Stephen Guest, are the sons of two, wealthier families who vie for the possession of Dorlecot Mill, once the property of the Tullivers.
[109] "'The music vibrating in her still': Music and Memory in George Eliot's *The Mill on the Floss* and *Daniel Deronda*," *Nineteenth Century Contexts* 21:4 (2000): 541-563, 549.

intensify this point and argue that Eliot's representation of musical courtship is overtly Darwinian. Lucy and Stephen Guest, at one point engaged to one another, sing a song entitled "Graceful Consort" from Haydn's "The Creation,"—a title which evokes strongly Darwin's ideas about natural selection, as does Eliot's description of their singing, which conveys a "sense of mutual fitness" that "fulfill[s] expectation just at the right moment."[110] But Eliot does not let her readers buy into her musical Darwinism as something natural, morally correct, or perfectly timed. Philip Wakem opines that such a song is "sugared complacency and flattering make-believe,"[111] critiquing not only Haydn's out-of-date musical style[112] but also the idea that humans should select their mates in such a manner. The inclusion of this disabled character's perspective suggests that theories of resonance and biological selection might be more speculative, or more "make-believe," than scientific fact, especially since such theories deliberately exclude even non-congenitally disabled people like himself. By including Wakem's dissent, Eliot builds a world where disabled characters can express subtly their resistance against the proto-eugenic logic of natural selection.

Indeed, it is Philip Wakem's status as disabled man, coupled with Maggie's embodiment of evolutionary planning gone awry, that formulates Eliot's implicit critique of the nature of Darwinian and aural theory within her fictional world. Even though a romantic attachment and marriage to Philip makes more sense given their intellectual and implicitly disabled alignment,

[110] 339. We should note that although the concept of natural selection is original to Darwin's work, the phrase "survival of the fittest" first appears in Herbert Spencer's *Principles of Biology* (1864) which appeared five years after the publication of *On The Origin of Species* (1859).
[111] 339.
[112] According to Da Souza Correa, Eliot's musical tastes, like her knowledge of science, were au courant: "Eliot's own early evolutionary interest in music is apparent from the article which she wrote for the *Westminster Review* after she and G. H. Lewes met Liszt in 1854. Liszt introduced them to Wagner's music, and 'Liszt, Wagner, and Weimar' is an appreciation, in evolutionary terms, of Wagner's views on the historical and future development of opera" 542.

Maggie's aural subjectivity steers her instincts wrongly. Her cousin Lucy's observation that she "likes a great rush of sound,"[113] predicts her preference for Stephen Guest's bass, "spirited" voice over that of Philip, whose lighter tenor only "touched, not thrilled."[114] She also listens to her brother Tom, who demands an end to her romantic relationship with Philip at multiple points, on the basis of both his disability and his father's wrongful acquisition of the Tulliver family's mill, which Tom sees as interrelated flaws.[115] These factors leave Maggie vulnerable to Stephen's sonic influence, to the point where she becomes powerless against his musical seduction: "Maggie, in spite of her resistance to the spirit of the song and to the singer, was taken hold of and shaken by the invisible influence,—was borne along by a wave too strong for her."[116] Without the presence of Dorlecot Mill and its protective "curtain of sound," Maggie is forced to find that aural environment elsewhere. Led astray from Philip's own musical overtures she falls into the trap of Stephen's voice, which is not a protective curtain but a strong "wave" of sound that obliterates her own agency. Although the musical competition between her potential suitors presents the appearance of Darwinian natural selection, and her choice of Stephen's voice over that of Philip's suggests a greater level of sympathetic resonance, in reality both of these aural connections are deeply damaging. They lead only to a prediction of the novel's disastrous ending, where Maggie is indeed "borne away by a wave too strong for her." The wave, once a sonic metaphor, becomes a literal wave of water leading to the destruction of the novel's built world.

[113] 385.
[114] Ibid.
[115] 386. Philip's status as a "humpback" is never properly disentangled from the idea of hereditary immorality or disability as moral punishment for his fathers sins: "Tom never quite lost the feeling that Philip, being the son of a "rascal," was his natural enemy; never thoroughly overcame his repulsion to Philip's deformity." ch 7 "the young idea"
[116] 386.

Eliot's world-destruction at the conclusion of her bildungsroman brings into question Maggie's viability as a fully developed heroine, and whether or not the author is indeed invested in carving out a fictional space for women that may not exist in her own world. It is easy to read her drowning, together with her brother, as a pessimistic statement on the viability of her existence within the built world of the novel. However, when we attend to the shift in Maggie's agency during the final scene of the novel, where she searches for and is ultimately reunited with her brother after a period of rejection and exile,[117] a different picture emerges. Whereas her overwhelming sonic resonance with Stephen Guest creates "passivity" that causes "her paralysis of will when she glides with him down the river,"[118] during the flood she begins to resonate with the river Floss once more, reentering the "great curtain of sound" in order to return home. Using aural cues and her own "loud, piercing voice," she once again exemplifies the idea of the female body as a receptive, navigational device, only this time freed from the linear, reproductive pressure of Darwinism. Her progress along the river Floss is marked by her ability to double back both literally and figuratively, as she moves both with and against the current in order to rescue and reconcile with her brother, whose own utterance of her childhood nickname, "Magsie,"[119] signals a return to the sonic world of her childhood. The fact that they drown together, swept away by a wave of debris, is less of a finality given this aural reconnection.[120]

[117] Maggie unintentionally elopes with Stephen Guest after their boat drifts down the river, resulting in Maggie's overnight absence from home. Maggie refuses to marry Guest to avoid scandal, and as a result becomes a social pariah, rejected from her brother in particular.
[118] Nancy Paxton, *George Eliot and Herbert Spencer: Feminism, Evolutionism, and the Reconstruction of Gender*, Princeton: Princeton University Press, 1991, 78.
[119] 482.
[120] Their drowning together at the end also references the beginning of another sibling drama, Shakespeare's *Twelfth Night*. Indeed, the novel can be read as a reversal of the play. At the very beginning of *Mill on the Floss*, Mr. Tulliver accuses his wife of being prejudiced against simple obstacles or signs that distract her from larger concerns: "You'd want me not to hire a good wagoner, 'cause he'd got a mole on his face." Mrs Tulliver defends herself by replying, "I'm

Because Eliot destroys their "topsy-turvy" bodies, once such a disappointment to their father's evolutionary planning, they are able to become part of the aural water-stuff of their fictional world, no longer bodies that mediate sound but soundwaves in and of themselves. As the novel concludes with a description of the siblings' tomb, where "the buried joy still seemed to hover, like a revisiting spirit,"[121] it is clear that they signify a continued life-after-death existence, both for the remaining characters of the novel who visit the tomb, and for the novel's readers. Maggie's lot is not to fail in the built world of the novel, but to resonate beyond it.

Maggie's transformation from an evolutionarily problematic body into a metaphorical soundwave once again situates *The Mill on the Floss* within the realm of speculative fiction. As Ian Duncan argues, Eliot's use of scientific discourse often lends her fiction a fantastical quality to the extent that some of her work is identified as a kind of science fiction.[122] In particular, Duncan observes that the scientific language in *Daniel Deronda* (1876) "discloses the kinship even of *Middlemarch* with those overtly fantastic works—the novella 'The Lifted Veil,' the dystopian fable 'Shadows of the Coming Race'—that are usually read as outliers in the George Eliot canon."[123] The same is undeniably true for *The Mill on the Floss*, which shares the same anticipatory, speculative quality of Eliot's novellas, particularly in the case of "The Lifted Veil"

sure I'm rether fond o' the moles; for my brother, as is dead an' gone, had a mole on his brow" (10). That Mrs. Tulliver's own sibling "had a mole on his brow" recalls the moment, at the end of *Twelfth Night*, where Viola, in the guise of Cesario, urges her brother Sebastian to recognize her: "My father had a mole upon his brow," to which Sebastian replies, "So had mine." (*The Norton Shakespeare* ed. Stephen Greenblatt, New York: W.W. Norton & Co., 1997, Act 5 Scene 2, ll. 235-236) The fact that Mrs. Tulliver, the unrecognized prophet of the novel, singles out a mole as a defining feature of kinship, signals the fact that she, her brother, and her children Tom and Maggie, share a literary kinship with Viola and Sebastian's sibling reunion, albeit in very different timelines.

[121] 484.

[122] "George Eliot's Science Fiction." *Representations*, 125.1 (2014): 15–39, 18.

[123] Ibid.

(1859) which Eliot completed while putting her novel on pause.[124] In the novella, the central male character, Latimer, grapples with his prophetic and telepathic abilities,[125] which both feminize him and make him distressingly aware of his wife's hatred towards him. The novella concludes with an extraordinary scene in which a dead female servant receives a blood transfusion from Latimer, enabling her to act phonographically and sound out a recording containing a verbal accusation of his wife's attempt to poison him.[126] Once again Eliot's speculative fiction focuses on how the female body acts as a sonic mediator, even after death, suggesting that the resonance between the alterity of women's bodies and emergent technologies is a common feature in the nineteenth-century projection of humanity's future existence.

Eliot's much later novella, "Shadows of the Coming Race," published in her last work, *Impressions of Theophrastus Such* (1879), reprises her previous literary experiments. In doing so, she participates in a type of futuristic world building, this time late in her career, that illustrates the inclusion and accessibility that Rosemarie Garland-Thomson identifies as features of disability-inclusive fictional worlds. The novella also engages implicitly with the flip side of that inclusion: eugenic world building. It draws its title from the earlier fantasy novel, Edward

[124] In her Introduction to *Mill on the Floss*, Juliette Atkinson specifies that due to her extralegal marriage to George Henry Lewes she was estranged from her brother and siblings. During her composition of novel Eliot's sister, Chrissey, died after reaching out to the author for the first time in years. During this time period Eliot composed "The Lifted Veil," "a strange tale of telepathy and blood transfusion," which relies on speculative ideas about the limited of human connection and communication (x).

[125] Latimer's abilities are clear echoes of Maggie's acute and aural abilities. Meegan Kennedy remarks that "he suffers not deceptive sensory function, but remarkably acute sensory function. […] Latimer consistently refers his experiences back to sound metaphors" ("'A True Prophet'? Speculation in Victorian Sensory Physiology and George Eliot's 'The Lifted Veil.'" *Nineteenth-Century Literature*, 71.3 (2016): 369-403, 380).

[126]

Bulwer-Lytton's *The Coming Race* (1871), which illustrates a satirical utopia where an advanced race uses a mystical, technological force called Vril as a malleable super-ability. *The Coming Race* later became source material for Nazi theories of the occult and their pseudoscientific justification of an Aryan master race.[127] However, in George Eliot's interpretation of this source material, its fictional depiction of a race charged with the electricity-like substance Vril takes on an entirely different form and purpose. Upon imagining a future race, the narrator speculates:

> Thus this planet may be filled with beings who will be blind and deaf as inmost rock, yet will execute changes as delicate and complicated as those of human language and all the intricate web we call its effects, without sensitive impression, without sensitive impulse: there may be, let us say, mute orations, mute rhapsodies, mute discussions, and no consciousness there even to enjoy the silence.[128]

These futuristic life forms are an evolution of *The Mill on the Floss*'s deafening "great curtain of sound," and an inheritance of Diderot's philosophical position "in silence and darkness," only this time operating in a network of blind, deaf, and mute signals. Even those these beings cannot receive sound, they are soundwaves or signals in and of themselves, functioning in much the same way as Maggie and Tom do in their fictional life-after-death. But what most strikes me, as I search for evidence of imagined futures that not only include but celebrate disability, is the

[127] Eric Kurlander observes that earlier 19th-century textual sources for Nazie pseudoscience and occult theory, such as Helena Blavatsky's *The Secret Doctrine* (1888), plagiarized Bulwer-Lytton, combining it loosely with Western interpretations of Eastern religion and philosophy (15). *Hitler's Monsters: A Supernatural History of the Third Reich*, New Haven: Yale University Press, 2017.

[128] "Shadows of the Coming Race," *Impressions of Theophrastus Such*, ed. Nancy Henry, Iowa City: University of Iowa Press, 1994, 142.

playfulness with which Eliot anticipates something like a world-wide web, where would-be silicon beings, blind and deaf to the signals they send out, nonetheless perform "orations," and "rhapsodies" for an audience who may be unconscious. At the end of her literary career, Eliot frees her anticipative future language and technology from the pressures of Darwinism and sonic theories, and even from constraints of 19th-century femininity, instead foregrounding the futurity of human technological existence in sensory disability. In doing so, she also frees her own literary work from a need for reading audience, and speculates about the nature of her own life-after-death. Even absent hearing and sight, even without consciousness, the creative outputs of these speculative, disabled authors of the future still matter.

Chapter 3

The Deaf Ancestry of the Telephone: Alexander Graham Bell in Crip Time

"To Alexander Graham Bell
Who has taught the deaf to speak
and enabled the listening ear to hear speech
from the Atlantic to the Rockies,
I dedicate this Story of My Life."

- Helen Keller, *The Story of My Life* (1905)

In her first autobiographical work, Helen Keller aligns herself with her former teacher, Alexander Graham Bell, imagining her own creative output as a disabled woman on the same timeline as Bell's innovations. In describing her teacher's two achievements, "t[eaching] the deaf to speak" and "enabl[ing] the listening ear to hear speech/ from the Atlantic to the Rockies," Keller implicitly lists her own successes, as a d/Deaf/Blind pupil who learned to communicate, and as a woman who published her life story for a transatlantic audience. In her praise of her teacher, Keller signals to her readers that her own work as a d/Deaf/Blind author is tacitly equal in stature to Bell's accomplishments, both pedagogical and scientific. Dedicating her autobiography to Bell in this way allows her to synchronize her autobiographical narrative of d/Deafness and Blindness with ongoing narratives of technological and social evolution. Thus, Keller provides us a model for the temporal realignment of Bell's invention with d/Deafness. It is not a mere coincidence that a teacher of d/Deaf children went on to invent the telephone; his work with the d/Deaf precedes and resumes alongside his later invention, and therefore the role of this community in his work should be regarded as central rather than peripheral to our understanding of the telephone. Through Keller's claiming of Bell's invention in parallel to her

own narrative of disability, so too can we claim disability as a parallel process of invention. Rather than a mere communicative obstacle, d/Deafness should be understood in the context of the telephone's history as an essential ancestor of modern communication networks.

Keller's dedication also reveals how her early 20th century personal narrative of d/Deafness and disability structured itself around the development of a relatively new method of educating and communicating with d/Deaf people: oralism. Even before Keller's lifetime, 1880-1968, a disruptive shift began to occur in the divide between hearing and Deaf culture. The American Deaf community of the early 19th century was a blended, bilingual culture that balanced English with sign, integrating the English-based manual alphabet[1] with what would become American Sign Language (ASL).[2] From 1840-1850 the oralist instructional method, which promoted lip-reading and speech pedagogy over any form of sign language, became globally dominant in the field of d/Deaf education, threatening to eliminate the bicultural community of the past, which had relied on manualist (signing) Deaf educational institutions as central locations for the acquisition of shared sign language. During the second half of the 19th century, most manualist schools for the Deaf shifted to oralist practices, all but eliminating these core, cultural sites.

For Bell, teaching the d/Deaf to speak was an evolutionary imperative. As Douglas Baynton argues, "It was no coincidence that oralist theory began to transform deaf education in

[1] The manual alphabet, signed into the palm of one's hand, was Keller's method of person-to-person communication. For reading and writing, she used Braille and Braille typewriters.
[2] That the early 19th century Deaf community was in fact bilingual and bicultural rather than solely "manual" is an important distinction made by R.A.R. Edwards, who argues that the deaf culture understood as "manual" takes away from an understanding of 19th-century deaf history that was a constant debate over efficient communication strategies and methods of instruction. *Words Made Flesh: Nineteenth Century Deaf Education and the Growth of Deaf Culture,* New York: New York University Press, 2012, 3.

the United States during the same period that evolutionary theory was radically changing how Americans defined themselves and their world."[3] As I discussed in my previous chapter, proto-Darwinian and evolutionary thought was very much present in mid nineteenth-century literary representations of human relationships and disability. This ideology only intensified when it transformed into eugenics, focusing on individual, identifiable, and inherited disabilities like d/Deafness. Sign language came to represent a "throwback" and "savage" method of early human communication, and teaching the deaf to speak became a religious, national, and evolutionary metaphor for enlightening, enfranchising, and humanizing people who would otherwise be left isolated, in the dark, and in "silence."[4] Baynton points out that this logic had become so pervasive by the end of the 19th century that one oralist, Emma Garret, wrote the following in 1883: "If speech is better for hearing people than barbaric signs, it is better for the deaf; being the 'fittest,' it has survived."[5] This evolutionary logic, in addition to making speech the clear evolutionary winner over sign language, also guided "eugenicist fears that intermarriage among the deaf, encouraged by separate schools and the use of sign language, would lead the 'formation of a deaf variety of the human race.'"[6] Bell himself, in writing the early eugenicist text that Baynton cites, "Memoirs upon the Formation of a Deaf Variety of the Human Race," became as synonymous in the d/Deaf community with eugenics and the campaign against sign language, as he is synonymous with the telephone in the mainstream, hearing world.

[3] *Forbidden Signs: American Culture and the Campaign Against Sign Language*. Chicago: Chicago University Press, 1996, 37. Here, Garret is referencing Herbert Spencer's interpretation of Darwin rather than Darwin himself.
[4] Ibid. In the U.S., sign language was also used by Native Americans. That both d/Deaf people and Native Americans used sign language was, for oralists, a sign that d/Deaf people who did not speak were "degenerating into savagery." Oralists routinely employed racist metaphors and analogies to describe d/Deaf people who either signed or resisted oral education (40-45).
[5] 43.
[6] 6.

For the modern Deaf community, and for many critics, Bell has remained as oralism's figurehead, with his status as a technological inventor clearly secondary. But Keller's dedication reveals that his speech-oriented pedagogy and his invention, in their own time, inhabited the same chronological and conceptual space. Bell's communication and sound technologies, the multi-signal telegraph (1874), the telephone (1876), the audiometer (1879), and various other devices, relied on the same cultural logic as oralism, a similar assumption that a full integration into a standardized, able-bodied network of communication was the most desirable and profitable outcome for any person. Bell himself characterized the telephone as a descendant of his failed experiments with a hearing assistive device, "a machine to hear for them,"[7] or what would be a modern-day hearing aid, further muddling his desire to help deaf people hear speech with his desire to transmit the human voice via electricity. As such, the two projects can be read as a single, united goal to standardize and network human communication based on normative sensory experiences. Later inventions of Bell's relative to the telephone, for example the audiometer, were used directly in the service of oralism. The audiometer was the first technology used to measure human hearing ability, allowing for the identification of d/Deaf and hard of hearing children during mass screenings in public schools, and selecting those children for an education in speech and lip reading.[8] Schools deliberately marked these children as physically different from their peers, and then paradoxically integrated them into an environment with only hearing peers and instructors. As I know from my own experience, this practice known as "mainstreaming," became possible in the late 19th century thanks to Bell's inventions and his

[7] Quoted in Charles Snyder, "Clarence John Blake and Alexander Graham Bell: Otology and the Telephone," *Annals of Otology, Rhinology, and Laryngology* 83:4 (1974): 30.
[8] Shephard, David. "Doctors Afield: Alexander Graham Bell, Doctor of Medicine." *Current Researches*, 53.4 (1974): 503.

belief in oralism, and continues to this present day.[9]

As we read the history that Keller outlines in her dedication, a history that combines Bell's invention of the telephone with the onset of oralist education, it is tempting to organize linearly the chronology so that invention of the telephone coincides with an attempted eradication of Deaf culture, so that the success of a technology supersedes the physical failure of deafness. But without wholly disregarding oralism's cultural violence against the Deaf community—including the physical disciplining of students who used sign-language, the forbidding of marriages amongst Deaf adults, the isolating of Deaf and hard-of-hearing children in entirely hearing schools—it is safe to say that d/Deafness is a persistent, alive, and vital part of our culture today. And the telephone, from its inception to its current iteration as a modern, networked smartphone, isn't a wholly successful technology: from poor sound quality to an over-reliance on a fragile and inconsistent global network, the telephone is also vulnerable to frequent missed connections and miscommunications. This technology is also integrated with disabled people's lives. Today the telephone functions as an assistive, adaptive device for many disabled people, and is easing and even transforming certain aspects of sign-language use because of its

[9] Mainstreaming was identified from its inception as deeply harmful and contradictory practice, as George Wing, a Deaf teacher at the Minnesota School for the Deaf, describes it in 1886 as "the medicine that swallowed the patient": "In prescribing 'environment of hearing children' as a remedy for the ills existing in the methods of instructing the deaf it is remarkable that the doctors have unanimously ordered that the medicine shall swallow the patient—in other words, that deaf children shall be 'assimilated' by the mass of children in the public schools! Naturally all attempts to carry out their directions have resulted in disaster" (170). "The Associative Feature in the Education of the Deaf" (1886), in *Deaf World: A Historical Reader and Primary Sourcebook*, ed. Louis Bragg, New York: New York University Press, 2001, 165-174. The modern Deaf community identifies mainstreaming as one of the processes of cultural genocide, in which Deaf and hard-of-hearing children who would benefit from the bilingual approach of spoken language and ASL are explicitly denied access to that benefit and by extension denied their place in the Deaf community. Their education often suffers as a result from a complete lack of effective accommodation and neglect.

new, visual capabilities.[10] Arguably, it has grown up alongside disability and deafness, and is closer to its deaf ancestry than ever before, far from fulfilling oralism's goals of eradicating deafness.

In order to understand the history of the telephone, we must attend to fact that the linear, progressive chronology that defines narratives of technological invention is undone by deaf ancestry. As scholars Alison Kafer, Margaret Price, and Ellen Samuels have theorized, disabled temporality, or "crip time," requires "a flexible approach to normative time frames" that acknowledges how certain bodies resist or are excluded from the deadlines, schedules, and intervals that privilege those who can be "on time."[11] Just as they are excluded from these "normative time frames" that structure our present-day lives, disabled people are also excluded from the future, as would-be parents are discouraged from passing their disabled genes onto their children, and recently disabled people are often told that they have "no future."[12] In response, Alison Kafer calls for a pressing "desire for crip futures" that requires "cultivating disability" rather than ignoring or eradicating it, and imagining a world where disabled, queer people, in particular those who are also people of color, are desired rather than feared and erased.[13] The crip future that Kafer calls for couldn't be further from the future Bell must have wanted, where fewer deaf children were born, and where sign language was no longer in use. But surprisingly,

[10] "Culture, Change, and Technology" in *Reading Between the Signs: Intercultural Communication for Sign Language Interpreters*. Sharon Neumann Solow. Boston: Intercultural Press, 2014.
[11] Margaret Price, *Mad At School: Rhetorics of Mental Disability and Academic Life*, Ann Arbor: University of Michigan Press, 2011, 62-63.
[12] Alison Kafer, *Feminist, Queer, Crip*, 3.
[13] Ibid, 45-46.

the future of the telephone, which does in fact arguably cultivate certain disabilities,[14] is not far from either imagined temporality. Just as it standardizes and commercializes everyday communication, the telephone also has the potential to embody a crip, technological future. And in order to preserve this imagined future, we must acknowledge its past, and the persistence of a deaf ancestry that counters normative progress.

Acknowledging the persistence of the telephone's deaf ancestry also requires a critical intervention on our part. Often Deaf studies and media studies scholars reduce the fact that deafness and other disabilities inspired or influenced the emergence of new technology down to the understanding that the relationship between technology and disability is one of curing or overcoming. As Michele Friedner and Stefan Helmreich argue, "[i]t is old news that technologies of sound reproduction and relay have been bound up with hearing and hard-of-hearing people's attempts to ameliorate deafness, commonly understood as a condition to be 'overcome.' From Thomas Edison to Alexander Graham Bell, phonographs and telephones have emerged in part from attempts to render the deaf hearing or to train deaf speech into alignment with the norms of the hearing world."[15] While it is true that a cure or erasure of deafness was the desired outcome of some of these technologies, this understanding restricts this technology to a timeline that it does not actually follow.

The assumption that technologies like the telephone were part of a curative, scientific agenda restricts this technology to a specific, linear chronology which Kafer calls "curative

[14] Here, I will specify that the present-day use of smartphones is obviously limited by social class and access to technology, and it only "cultivates" specific disabilities, like Deafness, after a significant repurposing of a technology designed for able-bodied users.
[15] "Sound Studies Meets Deaf Studies," in *The Auditory Culture Reader*, eds. Michael Bull and Les Black, London: Bloomsbury Academic, 2016, 88.

time." Curative time, in contrast to "cure,"[16] articulates "an understanding of disability that not only *expects* and *assumes* intervention but also cannot imagine or comprehend anything other than intervention."[17] Friedner and Helmreich are correct ascribing this cultural logic to inventors like Edison and Bell, but the fact remains that the phonograph and more importantly the telephone did not succeed in curing or even mitigating deafness, and in fact served radically different purposes and audiences. While the relationship between deafness and these technologies may be "old news," the idea that this relationship illustrates a different relationship with disability than "curative time" is new.

By claiming the deaf ancestry of the telephone, I argue that we can characterize the relationship between disability and the process of invention more precisely and inclusively. Rather than rely on previous critics' uncertain characterizations of the relationship between d/Deaf people and this invention— "bound up with" or "emerged in part from" to borrow Friedner and Helmreich's language—I choose to rename this relationship and define it alongside other critical terms.[18] For example, Mara Mills observes that later, 20th century sound engineers "lifted ideas and inspiration from the world of deaf 'assistive' technology […] For other engineers, deafness was never more than a metaphor or an advertisement." In response to this

[16] Here, Kafer is making a distinction that is a political flashpoint in disability rights debates. A desire for a cure was once assumed to be the equivalent of "selling out" your disabled identity and valuing an able-bodied experience over a disabled one. Now discussions about cure acknowledge individuals' complex relationships with illness and disability where desiring medical interventions does not mean foreclosing one's disabled identity. *Feminist, Queer, Crip*, 27.

[17] Ibid, 27.

[18] To give another example of how scholars interpret the relationship between deafness and the invention of the telephone, see Brenda Jo Brueggemann: "He stumbled onto the telephone—his most famous invention—because he was looking for a device that would help deaf people hear better." Her word choice of "stumble," implying a kind of disabled or impaired movement by which Bell invents the telephone, points to a deeper connection between deafness, disability, and invention.

role that deafness played in later sound technology, Mills coins the term "assistive pretext," borrowing from David Mitchell and Sharon Snyder's concept of narrative prosthesis, the idea being that deafness in the context of technoscience plays the role of the prop or the metaphor rather than a substantial, starring role.[19] In direct contrast to this critical term, "d/Deaf ancestry" makes the case for d/Deafness as an essential part of the telephone's evolution rather than a secondary, supporting feature of technology. More than a mere pretext for an invention, d/Deafness, in the particular context of the telephone's invention at the end of the 19th century, was indispensable to its creator, Alexander Graham Bell.

The narratives of invention surrounding the telephone in the late nineteenth century convey indispensability of d/Deafness, even as they are also accompanied by eugenic logic of oralism. As the son and husband of deaf women and a former teacher of the d/Deaf, Bell had his own deaf ancestry, and was quick to acknowledge the d/Deaf origins of his most famous invention. He also saw oralism as the natural evolution of his family practice, since his father and grandfather had been professionals in the field of speech mechanics.[20] This background accounts for Bell's particular emphasis on the place of d/Deafness in his narrative of invention. In an 1894 address to the Horace Mann School, second only to the Clarke School for the Deaf in its pioneering oralist methods, Bell's inherited, professional investment in oralism exists alongside an account of how his inventions progressed out of his deaf pedagogy.

[19] "Deaf Jam: From Inscription to Reproduction to Information," *Social Text*, 28.1 (2010): 35-58, 39.

[20] "As a student of the mechanism of speech, familiar with it from my childhood, this subject, in fact, having been the professional study of my family for three generations, I realized that deaf children whose vocal organs were perfect could be taught to speak." "Growth of the Oral Method of Instructing the Deaf." 10 November 1894, Horace Mann School, 25th Anniversary Address. Reprinted in *The Annual Report of the Committee on the Horace Mann School*, Boston: Press of Rockwell and Churchill, 1896. http://www.loc.gov/resource/magbell.37600101

> My original skepticism concerning the possibility of speech-reading had one good result: it led me to devise apparatus that might help the children. Why should we not make a machine to hear for them, a machine that should render visible to the eyes of the deaf the vibrations of the air that affect our ears as sound? I made many such machines. I varied my form of apparatus all the way from the phonautograph of Leon Scott up to an apparatus constructed of a human ear taken from a dead subject. A pencil actuated by the membrana tympani recorded upon a sheet of smoked glass the utterances that were spoken into the dead man's ear. These experiments were what the world calls failures; that is, they did not accomplish the result intended. I did not succeed in making an apparatus into which a deaf child could look and see the vibrations of speech so recorded as to enable him to understand what was said, or to recognize the elements of speech. It was a failure; but that apparatus, in process of time, became the telephone of today. It did not enable the deaf to see speech as others hear it, but it gave ears to the telegraph, and today we hear in Boston what is spoken in New York or Chicago.[21]

Remarkably, in this speech Bell admits initial "skepticism" about a core tenant of oralism, the

[21] I'm including this passage in its entirety since it stands apart from the rest of the speech in a significant way. The vast majority of the speech consists of statistics and evidence for the perceived superiority of the oralist method over sign language, which Bell touts as a perfect example of the "survival of the fittest." The comparatively brief account he provides of his invention of the telephone stands out as a departure from this evolutionary logic and its subject matter, and is often excerpted (most influentially by sound studies scholar Jonathan Sterne) from previous scholarly work that cites this portion of the speech in brief. Although the excerpt receives a great deal of scholarly attention, the speech as a whole does not. "Growth of the Oral Method of Instructing the Deaf." 10 November 1864, Horace Mann School, 25th Anniversary Address. Reprinted in *The Annual Report of the Committee on the Horace Mann School*, Boston: Press of Rockwell and Churchill, 1896. http://www.loc.gov/resource/magbell.37600101

assumption that people born deaf can be taught to lipread, pointing to the oral method's most obvious point of vulnerability.[22] More remarkable still is that his assistive device—"a machine to hear for them," which, far from the curative technology one would imagine, based on contemporary assumptions, as some kind of proto cochlear implant which replaces a d/Deaf ear with a mechanical one—is purely visual. "[A] machine that should render visible to the eyes of the deaf the vibrations of the air that affect our ears as sound" does not strike one as an invasive, intravenous device meant to replace deafness with hearing, but rather a device that acknowledges in part that Deaf people are first and foremost "the people of the eye."[23] Bell seems primarily concerned with efforts to make sound legible to d/Deaf people as a concept and as a linguistic tool, rather than attempting to "fix" their ears. Such methodology, by which sound is translated into a visual medium rather than simply amplified or reproduced, is at the heart of his conception of the telephone. This is a methodology informed by an acknowledgment of sensory difference rather than solely a desire to correct.

Bell's characterization of his technological attempts to visually communicate sound to d/Deaf people as "what the world calls failures" also articulates a complex relationship between disability and invention. By the time of this speech (1894), Bell's company, now known as the American Telephone and Telegraph Company (AT&T), had evolved from a small patent association into the beginnings of a monopoly after its incorporation in 1885. The inventor's own emphasis on the "process of time" by which a technological failure became a major scientific

[22] The idea that all Deaf people can lipread is a common stereotype. Although some d/Deaf people lipread, this ability is entirely subjective and depends on variations in people's hearing capabilities, linguistic background, and preferred communication methods. Oralism, as a practice, assumed that all deaf people could be taught to understand spoken language through reading lips, which proved both impossible and unnecessary for many people.
[23] Lane, Harlan, Richard C. Pillard and Ulf Hedberg, *The People of the Eye: Deaf Ethnicity and Ancestry*, Oxford: Oxford University Press, 2011.

and economic breakthrough reinforces the contradictory, crip temporality of the telephone. That his device failed to cure d/Deafness, or even to make sound waves visual, and succeeded instead in giving "ears to the telegraph," does not conjure up a linear narrative of progress but a strange, fragmented, and patch-worked technological embodiment.

The disabled "process of time" that led to the development of the telephone is a curious refraction in an otherwise linear narrative about the overwhelming success of oralism. Aside from this description of the telephone's invention, the rest of the speech is an enthusiastic endorsement of oralist methodologies. But even that endorsement is remarkable in its self-conscious commitment to curative time. It relies on Darwinist chronology to validate its own timeliness or scientific relevance; opposing sign language, and by extension Deaf people, by characterizing them as backward and primitive. Throughout his speech, Bell articulates the progression of oralism, which he characterizations uncritically yet accurately as an "invasion" into sign language schools, in Darwinian terms:

> It will thus be seen that natural selection, operating upon the continent of Europe for more than a century, has brought about the survival of the pure oral method and the almost total extinction of the French system of signs. The verdict of time is therefore conclusive as to the superiority of the oral over the sign method of instructing the deaf.[24]

That the "survival" of oralism happens at the expense of the "total extinction of the French system of signs" creates a clear, linear "verdict of time" where hearing culture triumphs over Deaf culture. The logic of his speech implies that oralism succeeds in assimilating or accommodating d/Deafness where his technology failed, reinforcing a narrative of progress and

[24] "Growth of the Oral Method of Instructing the Deaf." 10 November 1894.

erasure.

Taken as a whole, Bell's speech at the Horace Mann school has two competing timelines, that of an invention that arose out of failed experiments and remains tied to d/Deafness as a result, and that of oralism's "survival of the fittest" by which lipreading and speech have become dominant over a weaker sign language culture. Given that the majority of the speech emphasizes repetitively oralism's evolutionary success over a failing sign language,[25] it is surprising that Bell ascribes the success of the telephone to his failed experiments with creating visible sound waves. Bell's slip into a possible crip temporality is only perceivable when we attend to the rigid evolutionary narrative of dominance and progress that provides its backdrop.

The failure of this accommodating device and the success of its later evolution, the telephone, reads to many critics as an erasure and disavowal of disability rather than acknowledging the telephone's possible inclusion of it. But in doing so, these critics unknowingly follow Bell's own evolutionary logic or "curative time." Perhaps this is because Bell's description of the progression of the telephone out of "machine to hear for them" often appears excerpted and isolated from the rest of the speech, erasing the disconnect between Bell's technological "failure" and the "success" of oralism. For instance, Jonathan Sterne argues that Bell's choice of words, "machines to hear for them," implies a "*delegation* of hearing to a machine" which links the telephone to disembodied, prosthetic sound devices that separate the process of hearing from human bodies to machines. For Sterne, it is the separation of sound and hearing from human bodies that allows sound technology to evolve, and evolve away from its

[25] For example, Bell repeats that oralism is evidence of Spencer's theory of "survival of the fittest" twice, describes its "superiority," "success," and "progress" over a dozen times, and in contrast ascribes sign language to "struggle" and "failure"—the only other time he uses this last word out of the context of his inventions. Ibid.

initial purpose in making sound waves visible to d/Deaf. Today, hearing people use the "mechanical descendants"[26] of Bell's apparatus for the d/Deaf in the form of the speaking telephone. Sterne, reading the cultural history of the telephone in this excerpted description, sees a purposeful evolution away from the specific experience of d/Deafness to a universal experience of hearing, shared by all sound devices developed for an assumed, hearing public.[27] But in the original nineteenth-century source material, the "process of time" of the telephone and the evolutionary triumph of oralism do not coincide neatly on the same timeline, and as a result d/Deafness is not so easily erased from telephone's narrative of invention.

Other critics allow d/Deafness to remain integral to the telephone's cultural meaning in a way that troubles its signification of curative or evolutionary progress. Although Sterne argues that Bell's progressive inventions "have to be understood in his larger context to his opposition of deaf culture," Avital Ronell's earlier critical position in *The Telephone Book* (1989) allows the telephone to retain its resonances with this disability without framing it as an opposition. In a chapter titled "The Deaf" and following a page of indistinct print, presumably made to visually mimic the d/Deaf experience of illegible sound, she remarks that "Since one of the branches of its genealogical tree link it to the predicament of deafness, the telephone will always be hard of hearing, and thus unhinging."[28] Although her understanding of d/Deafness, in this work, never reaches beyond a superficial, philosophical statement of intellectual and physical "predicament," her observation about the telephone's "genealogical tree" reinforces the idea that it has never lost

[26] *The Audible Past: Cultural Origins of Sound Reproduction*. Durham: Duke University Press, 2003, 38.
[27] Ibid 39.
[28] *The Telephone Book*, Lincoln: University of Nebraska Press, 1989, 328.

its deaf ancestry.[29] Furthermore, Ronell's assertion that its "unhinging" nature "will always be" establishes that this technology operates in crip time. As we have seen even in much earlier nineteenth-century texts, disability is an essential part of imagining technology's futurity. Her own reading of Bell's speech and his failed invention of a "machine to hear for them," although once again isolated from its oralist context, describes the telephone as an "aberrant invention,"[30] a statement which effectively "crips," or acknowledges the disabled subjectivity, of an object known primarily for its later, connective, and implicitly able-bodied success.

The "unhinging" nature of the telephone's d/Deaf ancestry, which inverts linear narratives of success, failure, progress, and regression, also becomes imbedded in retellings of Bell's personal narrative of invention, particularly in regards to his own ancestry and family. Bell's father, Alexander Melville Bell, was the developer of a system called Visible Speech, an early version of oralist speech therapy as well as the theoretical foundation of his son's early technological experiments. His mother, Eliza Simmonds, was late-deafened, relying on lip-reading and writing to communicate. As Bell, like his father before him, began to assist in the family business, it became increasingly technological, leading Bell on a quest to perfect his father and grandfather's previous work by constructing speaking automata, experimenting with the telegraph, and even using Morse code to communicate with his mother.[31] Thus Bell's work was, as many of his biographers put it, "an inheritance," as well as an innovation. His earliest biographical narratives,

[29] Ronell: "Try to imagine the prelingually deaf, unable to hear their parents, denied entry into the Symbolic. Empirically, they risk being severely impaired, defective in their grasp of language" (328). These statements, although prejudiced against Deaf identity, do not disqualify Ronell's approach to Deafness and the telephone; rather they reinforce the notion that the functional object of the telephone, a "child" of the Deaf community, inhabits the same disabled subjectivity.
[30] Ibid, 329.
[31] Charlotte Gray, *Reluctant Genius: Alexander Graham Bell and the Passion for Invention,* 128.

over which he exerted a great deal of control,[32] reinforce this idea repeatedly. Catherine Mackenzie, Bell's first biographer and his former secretary, remarks at great length about Bell's "pride of ancestry:" "In a manner of speaking Alexander Graham Bell inherited the telephone. He was the third Bell in direct descent to be an expert in the field of speech."[33] Therefore the telephone has two intersecting inheritances, both disabled and professional: one situated in d/Deafness, and one situated in the Bell family business, both of which working to validate Bell's position as its inventor.

Subsequent biographers continued to represent the Bell family business as "an inheritance,"[34] in order to give credit to the work of Bell's father and grandfather at his own insistence and validate his own claim on the patent. His biography characterizes their work in speech pathology, most notably his father's development of Visible Speech, as "the most important link in that chain of inheritance which brought about the invention of the speaking telephone."[35] Bell's insistence on his own familial inheritance solidifies his claim as the rightful inventor of the telephone, which came under question when another inventor, Elisha Gray, came forward the same year that Bell filed the patent for the first telephone, with evidence that Gray had submitted a nearly identical patent the same morning as Bell.[36] Patent controversy aside, the emphasis or even over-

[32] Catherine Mackenzie, Bell's personal secretary and personal friend of the Bell family, wrote the first Alexander Graham Bell biography, *Alexander Graham Bell and the Contraction of Space* (1928), with his direct involvement and full access to the family papers. Although it was published six years after his death in 1922, it is perhaps the closest to Bell's desired self-image than other biographies.

[33] *Alexander Graham Bell: The Man Who Contracted Space*. New York: Grosset and Dunlap, 1928, 13.

[34] See chapter headings, Robert V. Bruce, *Alexander Graham Bell and the Conquest of Solitude* (1972)

[35] Mackenzie, 20.

[36] The patent controversy between Alexander Graham Bell and Elisha Gray took place in 1876 and again in 1888. They both filed a patent for a nearly identical device on the same morning to the same office. Bell won the patent case in 1876, aided in large part by his father-in-law,

emphasis on Bell's professional inheritance also attempts to overwrite Bell's familial connection to deaf women, as his biographers stress the former over the latter despite evidence to the contrary.

Biographers understandably commit themselves to linear, curative time, emphasizing the oralist and technological progress made from grandfather to father to son and reinforcing narratives of inheritance in order to solidify Bell's status as the sole inventor of the telephone. They downplay his relationship to the Deaf community and to his deaf female family members in order to eliminate a competing narrative about how, exactly, the telephone was conceived. Critical examinations of the telephone itself, however, carefully attend to the strange confluence of Bell's parents and its implications for this technology, re-emphasizing Bell's maternal deafness together with his paternal oralism. Ronell describes the space of Bell's invention, or conception, of the telephone as "the paterno-maternal space of a perforated ear."[37] She argues that the telephone, rather than a straightforward, inherited innovation, is a technological, feminized embodiment[38] of Bell's unusual parentage. "In a sense, [paternal oralism] imposed on Bell a system of denials as concerned the predicaments of his mother and his wife, both of whom were deaf. The telephone argues with this denial."[39] I interpret Ronell's "system of denials as concerned the predicaments of his mother and his wife" as referring the desire to cure, erase, or deny the deafness of Eliza Symonds, the mother, and Mabel Hubbard, the wife. However oral the telephone may be, obviously relying on

Gardiner Greene Hubbard, a well-established lawyer who specialized in patent law. In 1888, a patent officer, Zena Fisk Wilbur, signed an affidavit that he had shown Bell the caveat for Gray's device, after which Bell copied Gray's idea, and then lied and said his patent had been submitted first. Bell denied this and the Bell telephone company sued for patent infringement.

[37] *The Telephone Book*, 334.

[38] Although Ronell's book is dedicated in part to analyzing the feminization of this technology, I would argue that later iterations of this critical project would probably include a queer reading of the telephone, as her work refers continually to what could be a simultaneous, non-binary gender identification.

[39] Ibid, 61.

a hearing and voice in order to function practically, it did not succeed in the logical goal of Bell's paternal, professional line of descent: the homogenization and standardization of human communication. Because it emerged out of deafness, it continues to "argue" with the logic of oralism and curative time, to destabilize the boundary between d/Deaf and hearing.

This destabilization is again at odds with Bell's claiming of the telephone as his own familial inheritance, resulting from generations of expertise. This type of inheritance of genius was fundamentally eugenicist in the earliest sense, tied to the same temporal logical as evolution.[40] Bell's characterization of the telephone as the eugenic outcome of his own family's inherited expertise in speech pathology disintegrates partially given his mother's and wife's deafness. Because the telephone emerged from a family that made its living in communicating with deaf people and other speech related disabilities—a family which clearly valued its late-deafened mother—its eugenic ancestry makes the connection with deaf women something paradoxically desirable. That desirability is entirely at odds with eugenic discourse, which would hold that disabled people—especially disabled women, who embody reproductive potential for their own physical impairments, should not be allowed to have children, essentially denying them a place in the future.

Alexander Graham Bell reprised the hearing/deaf intermarriage between his parents, Alexander Melville Bell and Eliza Symonds, with his own marriage to Mabel Hubbard. Like his father, he too was a speech pathologist and inventor who choose to marry a deaf woman and have children with her. In the context of later nineteenth-century eugenic fears about disabled reproduction, the Bells worked hard to justify these marriages and to eliminate any possibility that

[40] Francis Galton's *Hereditary Genius* (1869) clearly influences Bell. Galton, a cousin of Charles Darwin, later coined the term "eugenics" in his 1883 book *Inquires into Human Faculty and Its Development*.

Symonds or Hubbard were devalued as wives and mothers because of their deafness. His choice in marriage also presented a challenge to Bell's identity as an inventor, a social progressive, and a later figurehead for scientific advancement. In repeating his family's tradition of marrying deaf women and returning to his familial past, Bell complicated his personal ambitions in scientific innovation and eugenic futurity.

Hubbard's deafness presented a threat to a eugenic, evolutionary understanding of scientific and social advancement, which held that the erasure of disability was necessary for a desirable future. As such, the popular narrative by which people read the invention of the telephone romanticized and simplified the relationship between Hubbard and Bell, inscribing it in curative time. A 1935 article in the *Washington Post*, part of a longer series entitled "Half-Forgotten Romances of American History" repeats the most well-known version of this story:

> To the enduring love of a man for a woman much of the magic of the telephone is due. While Alexander Graham Bell had made considerable progress on his invention before he met Mabel Hubbard, who was to become his wife, yet it was his zeal to discover a means by which she might be able to hear the human voice again that spurred him on to complete his undertaking.[41]

This clear articulation of a later, ableist perception of the telephone's invention reprises sentimental, patriarchal ideas about successful men curing disabled women. But it also exemplifies eagerness with which later 20th century texts ascribed the telephone to Bell's romance with Hubbard, since it takes pains to emphasize that Bell had already made

[41] Elisabeth, Ellicott P. "Telephone Invention had Origin in Inventor's Love for Deaf Girl." *The Washington Post (1923-1954)*, Sep 09, 1935, 8, *ProQuest Historical Newspapers: The Washington Post*, http://ezproxy.lib.utexas.edu/login?url=https://search-proquest-com.ezproxy.lib.utexas.edu/docview/150614710?accountid=7118.

"considerable progress on his invention" before meeting Hubbard, while also emphasizing that his "zeal" to make her hear "spurred him on" to completion. Underwritten into a merely inspirational role, her deafness, while apparently speeding Bell's inventive process, does so only through the inventor's own desires. Such a role reduces the possibility that a deaf woman could effectively be the "mother" of the telephone, locating its genesis entirely in a curative, paternal Bell.

Bell himself fought against this popular perception of his reasons for inventing of the telephone. As Bell sought control over his professional and familial history he sought out clear lines of descent which established the telephone at the intersection of his inherited professional interests, his marriage to Hubbard, and his relationship with d/Deafness. Firstly, he wanted to the telephone to be perceived as a continuation of his and his family's work with oralism and deaf pedagogy. Secondly, the development of the telephone was intertwined with his wife's family for economic and legal reasons, making the Hubbard's ties to her husband's company financial rather than personal or romantic. Thirdly, Bell did not want the public to perceive his wife's deafness as in need of cure, since that would imply that she belonged to a larger category of disabled women who were barred from the status of domestic partner and mother.

The first biographer to contend with the disquiet over Mabel Hubbard's role in Bell's narrative of invention was Catherine Mackenzie, the Bell family's personal secretary. She refutes multiple narratives of invention and attempts to establish a clearer timeline, specifically by eliminating the version where Bell invented the telephone specifically so that his wife could hear again, labeling it "erroneous":

> A popular version, however, has erroneously made the telephone a direct result of Bell's efforts to give hearing, or a substitute for hearing, to Mabel Hubbard. She

> was, of course, studying articulation under his direction during his early work on the telephone, and their later love affair was to influence profoundly the development of Bell's invention. But the first experiments to 'devise an apparatus that might help deaf children' were, by Bell's own account, initiated by his earlier work at the Horace Mann School. These experiments led directly to the speaking telephone.[42]

Situating the actual development of the telephone in Bell's work with d/Deaf children reinforces his paternalism, and by extension this work's connection to Bell's own paternal line and a long tradition of oralist discourse. As clear as this line of descent would seem, as his "experiments" at the oralist Horace Mann School "led directly" to Bell's invention, Mabel Hubbard complicates this linear sequence of events. Involved at the beginning of his "early work on the telephone" as his pupil, her "later love affair" influences her husband's process of invention. She is both "early" and "late" in this timeline, and her contributions are, in this context, as non-specified as they are profound.

Mackenzie does not do away entirely with Hubbard's influence over the telephone's evolution, but she does shift her role away from that of a deaf pupil to an economic shareholder. The precise nature of her influence is not tied not to the inspirational nature of her deafness, and is instead tied to her family's financial control over Bell's invention. This early biography transforms the curative timeline of his pedagogical work and his scientific discovery into a courtship tale where he must please a stubborn and skeptical father-in-law, Gardiner Greene Hubbard. A patent lawyer by profession, Hubbard Bell's father apparently made the marriage between his daughter and Bell contingent upon the successful development and patenting of the

[42] Mackenzie, 56.

telephone, forbidding them to marry until this was achieved. When the marriage took place in 1877, the year after the telephone was officially patented, "Bell made over to his bride all his interest in the telephone" as a wedding gift.[43] For their honeymoon, the newlyweds traveled to England to promote the new invention, with Hubbard Bell serving as a hostess and social curiosity in order to advertise her husband's joint professional interests in technology and the Oralist method, of which she was a star pupil.[44] Rather than embodying the "magic of the telephone,"[45] she instead embodied the unification of its commercial success with the success of oralism, allowing Bell's familial, professional line to be united with his new invention.

But before Bell, his wife, and their subsequent biographers managed carefully Hubbard Bell's role in the relation to the telephone, her deafness was a potential complication for the Bell family. Without knowledge of her status as a star pupil of oralism, her deafness was perceived as a significant threat to the family bloodline by none other than Bell's deaf mother, Eliza Symonds. Upon announcing his engagement to a deaf woman, a family drama unfolded, demonstrating the deep anxiety toward hereditary deafness. His family reacted with alarm, his mother tempering her faith in her son's judgment with fears about her future genetic legacy: "You are of course the best judge of the sort of person calculated to make you happy, but if she is a congenital deaf mute, I should have great fears for your children."[46] Her son responded with fury, scolding his mother for characterizing Mabel as a "deaf-mute," and chastising her for her

[43] Ibid, 100.
[44] Fred de Land recounts how the Hubbard family put Mabel's accomplishments in speech and foreign languages on public display in order to endorse the Oralist method for new schools for the deaf. Most notably, she testified in a congressional hearing in order to increase federal funding for the Horace Mann Scholl. *Dumb No Longer*, 62.
[45] "Telephone Invention had Origin in Inventor's Love for Deaf Girl."
[46] Bell, Eliza Symonds. Letter to Alexander Graham Bell. 4 July Aug. 1875. MS. Canada, Brantford, Ontario. Library of Congress. https://cdn.loc.gov/service/mss/magbell/027/02700105/02700105.pdf

hypocrisy. “[I] was certain you would sympathize with Mabel — for as you were deaf yourself.”[47] Eliza Symonds was quick to reply, and abruptly reversing her position when faced with her son’s passionate criticism and newly armed with the knowledge that Hubbard, like herself, was late-deafened. “You had no reason whatever for assuming that Mabel's deafness would be any objection to us, it would be ridiculous for us to object to your following your Father's example […] My remark about a deaf-mute was rather an enquiry than anything else.” For the Bell family, the distinction between “congenital deaf-mute” and “deaf” was key to their endorsement of the match, and, finding that Mabel Hubbard belonged to the latter category, she was promptly accepted as a continuation of the Bell family tradition of marrying deaf women.

The epistolary drama surrounding Bell’s marriage to Mabel Hubbard stages for us the nascent 19th century eugenic fears about disability, heredity, and intermarriage,[48] a drama continued in his well-known eugenic treatise, *Memoir Upon the Formation of a Deaf Variety of the Human Race* (1883). Published by the National Academy of Sciences six years after his marriage to Mabel Hubbard,[49] the *Memoir* exemplifies Bell’s continued interest in d/Deaf ancestry and heredity even as he improved upon the telephone and built his business. A meticulous analysis of a compilation of enrollments and family trees, gleaned from the records of asylums and schools for the d/Deaf, the *Memoir* argued that deafness was hereditary especially in the instance of intramarriage between congenitally deaf people. Stoking eugenic fears, Bell

[47] Bell, Alexander Graham. Letter to Eliza Symonds. 23 Aug. 1875. MS. Canada, Brantford, Ontario. Library of Congress. https://memory.loc.gov/mss/magbell/027/02700109/02700109.pdf

[48] Interestingly, Bell’s proposal to Mable Hubbard took place in the foreground of a Deaf intramarriage that Eliza Symonds narrates in her letters, between her husband’s (Bell’s father’s) former pupils, “Deaf William” and “Pollie,” who marry after having an illegitimate child together despite the protesting of the Bells.

[49] Notably, all the Bell children were born by this date. Of four children, 2 daughters and 2 sons, only the daughters survived. The sons, born 1881 and in 1883, shortly before Bell published the *Memoir*, died in infancy.

concluded that hereditary deafness was on the rise based on his statistics, predicting the ascendance of a "deaf variety of the human race" and cautioning against all-deaf families.

The temporality of this text works in opposition to the crip temporality of the d/Deaf ancestry of the telephone: *Memoir Upon the Formation of a Deaf Variety of the Human Race* operates on a curative timeline where the ancestral record of d/Deaf people justifies their future annihilation. Using the institutional records of d/Deaf communities as his evidence, Bell concludes that "I have shown that sexual selection is at work among the deaf and dumb, tending to produce a deaf variety of the human race."[50] He appeals to "Those who believe as I do, that the production of a defective race of human beings would be a great calamity to the world" and calls for both "repressive"—actual laws prohibiting d/Deaf intermarriage marriage and reproduction—and "preventive"—institutional policies that would discourage sign language and integrate d/Deaf and hearing students in the same school—measures. The explicit purpose of this paper was to prove the existence of hereditary d/Deafness and to effectively end it.

Despite this aim, reading the *Memoir* and its attempt to extinguish hereditary deafness, and more broadly Deaf culture, can also be an exercise in crip temporality even as the text itself works actively against those possibility crip futures. Bell's eugenic texts do not resist conforming to curative timelines, we as readers must perform that resistance. The modern legacy of oralism are generations of d/Deaf children and adults raised in isolation from the larger Deaf community. In the hands of that audience, the *Memoir* is not only warning of future generations of deaf people born like themselves, but also a record of a deaf past. Literally drawn from familial

[50] Alexander Graham Bell, *Memoir Upon the Formation of a Deaf Variety of the Human Race*. New Haven: National Academy of Sciences. 13 November 1883, 41.

records of generations of d/Deaf Americans, Bell's statistical record of the potential rise of "deaf variety of the human race" is, for this audience, ultimate evidence of d/Deaf ancestry.

Curiously titled as a "Memoir," perhaps to reference its reliance on a previous half century of data, or to refer to Bell's past as a Deaf educator in contrast to his present reputation as an inventor and businessman, this paper looks back more than it looks forward. For a modern d/Deaf or hard of hearing reader, Bell provides a rich history, the tables and family trees not indicating a disturbing ascendance of an inferior race but overwhelming evidence that d/Deaf people survived and even thrived in early 19th-century America. We may be tempted to look for the names of our ancestors here, to see them recorded as pupils, as newlyweds, as parents and grandparents. One example of "pure" d/Deafness, from records by a Dr. Turner, is "the case of one woman who lived to see great grandchildren, and of these no less than sixteen were deaf-mutes."[51] Although anonymous and reduced to the sheer number of her deaf offspring, the woman cited anecdotally alongside statistical tables of d/Deaf families is one example of the admirable persistence of deaf ancestry, fertility, and longevity.

We can also inscribe the *Memoir* in an alternative, crip timeline in addition to reading it as a long-standing record of a disabled past. In warning against the current institutional models of deaf education, in which d/Deaf people had formed sign-language communities which often intramarried, Bell opens up a hypothetical, temporal space which we can repurpose. Cautioning that "We are on the way therefore towards the formation of a deaf variety of the human race. Time alone is necessary to accomplish the result,"[52] Bell presents his audience with a d/Deaf dystopia, a vision of a d/Deaf variety of the human race if the U.S. continues on its present

[51] Ibid, 20.
[52] Ibid, 44.

course to educate them. He asks, "Let us, then, consider how we might proceed to form a race of deaf-mutes, if we desired so to do, and let us compare the steps of the process with those that have been adopted by philanthropists and others, from the purest and most disinterested motives, to ameliorate the condition of the deaf and dumb. How would we commence?"[53] He proceeds to describe the currently existing Deaf community, which grows ever stronger in the future, maintaining its independent, unique culture apart from hearing society. Intending to describe a dystopic future where d/Deaf people form their own social groups, "attend school reunions," "write their own newspapers and periodicals", "perform their own plays and entertainment," and find "partners in life" who share the same sign language,[54] Bell describes unintentionally what is for many d/Deaf people a perfect existence, even from a contemporary perspective. This vision of an alternative future in which Deaf culture thrives, even within the hypothetical space Bell creates as a rhetorical device to warn his audience against that very possibility, is crip temporality.

If reading Bell's eugenic text for its crip temporality is an act of resistance, a larger examination of the *Memoir* reveals that, to a certain extent, that resistance may be assisted by Bell's own inconsistencies. His unwillingness to frame his invention of the telephone as a part of a straightforward, progressive effort to cure d/Deafness, particularly his wife's deafness, is reflected in a later uneasiness towards outright prohibiting d/Deaf intramarriage in order to prevent hereditary deafness. After several rightfully outraged admonishments from leaders in the Deaf community, Bell hastened to mitigate his call for a law against d/Deaf intramarriage.[55] In a

[53] Ibid, 41.
[54] Ibid, 41-42.
[55] Bell's authorized biographer, Catherine Mackenzie, downplays the *Memoir* a great deal, emphasizing its "unfortunate title" and summarizing it in this way: "It roused a storm of opposition from sign-language adherents, and then—as Bell used to tell—a news-paper reporter

speech entitled “Marriage: An Address to the Deaf,” given eight years after the publication of *Memoir*, he insists that his reputation for forbidding marriages between deaf people “is not true.”[56] He adds, “You can marry whom you choose, and I hope you will be happy. It is not for me to blame you for marrying to suit yourselves, for you all know that I myself, the son of a deaf mother, have married a deaf wife.”[57] But as we know, Bell was careful to distinguish between his wife’s and mother’s acquired deafness and congenital, hereditary deafness, a distinction which he indirectly encourages his audience to perceive in the rest of this speech, where he once again details the records proving that marriages between to d/Deaf people result in deaf offspring. Jennifer Esmail describes this particular, manipulative situation aptly: “This waffling between a position that sees deaf people as a collective threat to the human race and a position that suggests that he cares about the individual needs of each deaf student is disingenuous at best.”[58]

Bell’s “waffling,” however, reveals more than just his disingenuousness. Even in the *Memoir*, Bell’s admission of his own inconsistencies and the weaknesses of his data point to an

happened to pick up a copy of the pamphlet in the office of a member of Congress, and, glancing hastily at the title, gave it to the world that AGB was demoralizing Congress to prevent the Deaf from marrying! This error created much hostility to Bell among deaf persons who never read the memoir, but the study itself attracted wide and serious attention” (251).

[56] “Marriage: An Address to the Deaf,” Literary Society of Kendall Green, Washington, D.C., 1891. Washington, D.C.: Volta Bureau, 1898, 4. This statement contradicts his previous call for “repressive measures” to prevent hereditary deafness in the *Memoir*, where he theorizes at length about the most effective legislation prohibiting marriage: “For instance, a law forbidding congenitally deaf persons from intermarrying would go a long way towards checking the evil. Such a law might, however, become inoperative on account of the impossibility of proving that a person had been born deaf. Legislation forbidding the intermarriage of persons belonging to families containing more than one deaf-mute would be more practicable. This would cover the intermarriage of hearing persons belonging to such families, and also the case of a consanguineous marriage in a deaf-mute family” (45).

[57] Ibid, 4.

[58] “‘A Deaf Variety of the Human Race’?: Sign Language, Deaf Marriage, and Utopian and Dystopian Visions of Deaf Communities” in *Reading Victorian Deafness*, Columbus: Ohio University Press, 2013, 146.

understanding of defect that goes beyond the mere impulse to eradicate it, as much as that understanding goes against the grain of the *Memoir*'s curative timeline. Just as he pointed to his experimental failures leading up to his invention of the telephone, he continues to acknowledge the role that defective and incomplete data plays in scientific theory even as he uses that data to propagate eugenicist ideas about d/Deafness.

The science that Bell practiced has a unique temporality: while his technological developments in sound technology were ahead of their time and forward-thinking, his project of eliminating hereditary deafness required a constant look backwards at ancestral records, searching for the root of present and future deafness. Both sciences suffered from their reliance on material either out of reach in the future or eroded by the past—the telephone was plagued with sound quality, connectivity, and user interface issues,[59] and the eugenic project of chronicling family records was mired in historical, institutional misunderstandings of the difference between congenital and acquired deafness.[60] For his eugenic project, Bell occupied the uneasy position of proving supposedly scientific eugenic theory with flawed historical records. He was the beneficiary of Darwinist and statistical theories[61] that had only gained ground in the few decades preceding him, and was in a prime position to benefit from a near century of detailed institutional record keeping, but many of these records failed to distinguish between congenital and acquired deafness, a key distinction for arguments about heredity.

Like other eugenicists, Bell thought by amassing statistical information he could

[59] For a detailed account of the technological flaws in the early telephone system, see Venus Green's *Race on the Line*, Durham: Duke University Press, 2001, 16-18.
[60] See my previous discussion of George Eliot's awareness of this same problem in her discussion of Philip Wakem's disability, where she specifies that Tom is unable to make a nuanced determination about his friend's disability being hereditary or acquired through happenstance.
[61] Francis Galton was the found of modern statistics in addition to eugenics.

overcome these inconsistencies, and he used the impressive scientific resources at his disposal, the Volta Bureau, to begin doing so.[62] Unlike other eugenicists, however, who sought to consolidate the process of record keeping in order to justify mass sterilization, amongst other racist, ableist, classist, and sexist policies, Bell acknowledged the inconsistency of the records in the first place.[63] Compared to his contemporaries, Bell was more invested in the appearance of scientific objectivity than he was in presenting the appearance of infallible data in order to rationalize genocidal actions.

In the *Memoir,* Bell's theory about the future "formation of a deaf variety of the human race" rested upon an institutional past that was fundamentally at odds with his modern definition of deafness. The records he was using where gathered from various schools and institutions, both manual (sign-language) and oralist, and many of which did not make distinctions about the origin of the deafness of their pupils. Whether or not a deaf person was congenitally deaf or late-deafened, like his wife and mother, was of outmost importance to Bell for multiple reasons. He expresses a great deal of frustration with the lack of consistency in the records that prevent him from making definitive claims, citing many instances where there is "No distinction being made between those who were congenitally deaf and those who became deaf from accidental causes." Using flawed statistical data, data that often failed to make a cohesive distinction between two

[62] After winning the Volta Prize in 1880 for the invention of the telephone, Bell dedicated a significant portion of his Volta Laboratories in Washington D.C. to "his statistical work" i.e. his work on hereditary deafness. The bulk of the Volta Laboratories were dedicated to perfecting the technologies associated with the telephone, as well as others. Catherine Mackenzie, *Alexander Graham Bell and the Contraction of Space* (1928).

[63] Garland E. Allen argues that eugenicist institutions, especially in the beginning of the 20th century, struggled to provide a united, ideological front in the face of an ultimately decentralized and fragmented social movement. The efforts of the Eugenic Record Office at Cold Springs Harbor, for example, were meant to provide the appearance of infallible, monolithic system of institutional record keeping. "The Eugenic Record Office at Cold Springs Harbor, 1910-1940: An Essay on Institutional History." *Osiris* 2 (1986): 227.

types of deafness, thus becomes his only method of tracking perceived flaws in the human body. Conceivably, Bell's attitudes of fear, suspicion, and resentment targeted toward the Deaf population are as much about the data as much they are about the people that the data represents. As such, the *Memoir* represents a self-conscious, fundamentally flawed, imperfect, and inconsistent identifying record of d/Deafness.

The fact that Bell was working with an imperfect dataset, a statistical compilation which even he regarded as "incomplete,"[64] complicates Bell's attempts to control the d/Deaf population of the United States and his place in the creation of a statistical "norm." As Lennard Davis argues in his analysis of Sir Francis Galton's newfound statistical theory and its "symbiotic" relationship with eugenicist beliefs, the combination of evolutionary theory, statistical record keeping, and eugenics "bring[s] into society the concept of the norm, particularly of the normal body, and thus in effect create the concept of the disabled body."[65] Bell's frustration with and suspicion of certain statistical records and institutional practices suggests that for him, the norm extends beyond the human body and encompasses the institutions that describe and contain those bodies. In addition to illustrating the threat of hereditary deafness and thus creating a new "norm," for deafness, that of late-deafened or Oral deaf people, Bell also wanted to create an institutional norm that made that distinction effectively.

For example, in later text entitled "Is There a Correlation Between Defects of the Senses?",[66] Bell compiles statistics to ascertain whether or not deafness leaves bodies vulnerable to the acquisition of other "defects" including blindness and "idiocy." He concludes, based on institutional data, that this correlation is true, especially since institutions for the d/Deaf record

[64] pg. 4
[65] pg. 14
[66] pg. 17

high numbers of people who are also deemed insane and vice versa. But once again he also makes a powerful statement about the vulnerability of the data itself, cautioning against accepting the returns of his statistical analysis: "The returns have not yet been sufficiently analyzed to enable us even to separate the congenital from the adventitious cases. We cannot therefore tell at the present time how far the evidences of correlation may be weakened by a closer inspection of details." This "weakening" of his own statistical analysis suggests that Bell took issue with institutional records of the past, which he saw as at odds with "the present time." The purpose of this later text, in fact, does not seem to be an answer to his titular question, "is there a correlation between defects of the senses?" but in fact cautionary tale against wrongfully institutionalizing d/Deaf people in asylums. He concludes the text with the case of a deaf young woman:

> I recently met a young lady—one of the brightest and best pupils of the Illinois institution for the deaf and dumb—who commenced her school-life in an idiot-asylum. She was there discovered to be simply deaf, and was transferred to the Institution of the deaf and dumb at Jacksonville, where she not only received a good education, but was successfully taught to speak. Not only are children who are simply deaf, sometimes sent to idiot-schools; but idiotic children who hear perfectly are often sent to institutions of the deaf and dumb, when it becomes the painful duty of the principal to undeceive the parents as the real condition of their child.[67]

This anecdotal cap on a longer compilation of statistical data and analysis serves to illustrate for his readers the fallacy of believing "defects" to be interchangeable, with the goal of removing the

[67] 129.

undesirable trait of "idiocy" from the social construction of deafness in the late nineteenth century. The "young lady," which Bell specifies is "one of the brightest and best," serves as a clear example of the dangers of conflating two "classes of defective persons" who have in common "the absence of articulate speech."[68] His project of re-classifying d/Deaf people becomes as much about removing them from the institutional authority of insane asylums as it is about integrating them into oralist institutions. To be, as he puts it, "simply deaf," is a redeemable disabled identity distilled from the stigma of mental illness or disability. These are the particular goals behind Bell's eugenicist work—the redefinition of deaf people as part of a unique class susceptible to improvement and reintegration into the hearing world, not to be thrown into the larger pool of undesirable defects as they were in the past.

Until now, it has been assumed that Bell was a wholehearted founder of the eugenic movement, fully committed to the effort of preventing d/Deaf people from marrying each other as he was from eliminating any and all sign language use. But here, we may have failed to reconcile Bell's more influential, early texts such as *Memoir Upon the Formation of a Deaf Variety of the Human Race* (1883), with his evolving ideas. As Brian Greenwald and John Vickrey Van Cleve, both working from Gallaudet University, observe: "over the last four decades, scholars have continued to denounce the American inventor, suggesting similarities between Bell's eugenic activities and Adolf Hitler's; insisting that Bell 'campaigned for sterilization of deaf girls, and the proscription of marriage between deaf persons;' and 'strongly encouraged educators, administrators, and the Deaf community to stop marriages between congenitally deaf people.'"[69] But the actual historical record of Bell's later work in eugenics

[68] 129.
[69] "'A Deaf Varity of the Human Race': Historical Memory, Alexander Graham Bell, and Eugenics." *The Journal of the Gilded Age and Progressive Era*, 14 (2015), 28.

reveals an outspoken resistance to draconian and violent laws prohibiting d/Deaf intramarriage and legalizing the sterilization of d/Deaf people, as well as a less vehement disavowal of sign language. Greenwald and Van Cleeve argue that the *Memoir* was written during the height of Bell's eugenicist fervor, which was later tempered in early 20th century as his "relationship with organized American eugenics became increasingly paradoxical." While "he relished attention to his studies of deafness," he also "feared their use in punitive and restrictive public policies.[70] Working with prominent Deaf teachers and advocates of sign language, Bell sought to prevent eugenic policies from becoming a reality even as he served on eugenics committees.[71] In other words, Bell changed his mind somewhat as he continued to work in the fields of technology and deaf heredity.

Without taking his later, more tempered positions into account, we have consigned Bell to a static position where his horrific eugenicist agendas remain firmly behind his invention of the telephone. But this timeline does not resonate with crip temporality of the telephone, or indeed with Bell's inconsistent efforts to eliminate a d/Deaf future. In actuality, the d/Deaf ancestry of the telephone does not adhere to the one-track ideology of curative time, nor does it yet fully occupy its own space in crip time. The d/Deaf people to which the telephone maintains its interconnection in an ongoing conversation about accommodation, technological innovation, and disabled identity have yet to claim this object as a rightful inheritance alongside hearing assistive technologies like aids and even cochlear implants. Understanding these technologies as potentially non-curative, as participating in a long tradition of d/Deaf innovation and invention, is essential to reclaiming them.

[70] Ibid, 39.
[71] Ibid, 40.

Chapter 3

"Accessible Telephony: Women Operators in Florence McLandburgh's 'The Automaton Ear' and Elizabeth Stuart Phelps's 'The Chief Operator'"

The founding and development of the Bell telephone system in the late nineteeth and early twentieth centuries is a narrative continuation of "The Romance of the Telephone"—the popularized story of the intimate connection between an able-bodied, male entrepreneur, his deaf wife, and emergent technology—that I discuss in the preceding chapter. The categories of—and intersection between—gender and disability, specifically femininity and deafness, came to define the Bell telephone system's corporate identity, its marketing strategies, and its textual representations. I argue that femininity and d/Deafness/disability were not only integral to the founding of the telephone system, but also remained omnipresent in the telephone's cultural memory. As the telephone solidified its existence as both as a widespread communication technology and as cultural signifier for human interconnectedness, the dual figures of the deaf woman and female telephone operator persisted.

Nowhere is this continuation of gender and disability intersectionality clearer than in Fred de Land's passionate account of oralism's "war" against sign language, *Dumb No Longer: The Romance of the Telephone* (1908).[1] Within this narrative, which combines Bell's dual projects, oralist education and the development of the Bell telephone system, we can see how these projects reflected one another in terms of their female workforce. De Land attributes the greatest victories against sign language to women teachers of the deaf, who succeeded in enforcing the practice lip-reading and speaking amongst their students rather than relying on fingerspelling and

[1] Washington: Volta Bureau, 1908. Fred de Land was the head of Volta Bureau at the time of this publication. The Volta Bureau, which Bell established with his winnings from the Volta Prize, became Bell Labs, and eventually the seat of AT&T.

other methods of signing.[2] He argues that oralist schools gained the advantage over older, sign-language based schools of the Deaf by using this gendered hiring practice, since these other schools had used primarily male instructors. This wasn't the first time that the Volta Bureau[3] benefitted from a predominantly female workforce. Indeed, an army of women employees seems to be the winning strategy in both of Bell's monopolies over oralist education and the telephone system, according to accounts of the company's early days. By 1878, following a "chaotic" two-year period where telephone subscribers were responsible for their own lines, The Western Electric Company, later incorporated into The American Telephone and Telegraph Company, employed the first woman telephone operator, Emma N. Nutt.[4] She, alongside a vast majority of women operators, became responsible for "'mak[ing] sure the message went through correctly […]If they could not hear distinctly or get the message correctly, the operator was supposed to transmit.'"[5] Directly in parallel with women teachers of the d/Deaf who were responsible for conveying standardized language through the oralist educational system, women telephone operators were also key performers in the standardization of technological communication. In the grip of a new technology that enabled oral communication but did not at all guarantee its quality or clarity, operators became instrumental in mediating sound "distinctly" and "correctly." They were the teachers of a new kind of technological sound which had effectively deafened telephone subscribers—without them transmitting, the system did not function. As descendants of the mid nineteenth-century female, sonic mediators that I discuss in previous chapters, telephone

[2] "How the Women Helped to Win," Washington D.C.: The Volta Bureau, 1908, 59-65.
[3] Fred de Land was the superintendent of the Volta Bureau and the official compiler of the Bell family's biographical material. Catherine Mackenzie, *Alexander Graham Bell: The Man Who Contracted Space*, New York: Grosset and Dunlap, 1928, ix.
[4] Venus Green, *Race on the Line: Gender, Labor, and Technology in the Bell System 1876-1980*, Durham: Duke University Press, 2001, 16.
[5] Ibid, 16-17.

operators, both real and fictional, disrupted the Bell system's attempts to control the telephone's economic and cultural monopolies. In corporate and literary representations of the telephone, the narrative of women's aurality continued to reemerge as a creative force.

Frictional Access and the Technoscience of the Telephone

In recognizing the centrality of the intersection between gender and disability within the Bell telephone system, I draw from Aimie Hamraie's and Kelly Fritsch's recent theories of crip technoscience, which integrate previous theories of feminist technoscience.[6] They build on the idea that *"*[t]he promise of feminist technoscience lies in challenging hegemonic narratives about technology as always enframing or deterministic."[7] Instead of examining only the ways in which technology and science have sought to control or even destroy female bodies, theorists of feminist technoscience, beginning with Donna Haraway, have also uncovered "practices that push technoscience beyond the military-industrial into the realms of activist resistance and world-remaking."[8] Understanding technoscience in a feminist, crip context is always a push and pull between its destructive, policing qualities and its potential for radical inclusion and creation. As such, technoscience always includes the process of what Fritsch and Hamraie term "frictional access." They argue that frictional access takes into account the fact that accessibility is a simultaneous action of assimilation and inclusion, since "the etymology of the word *access* reveals two frictional meanings: access as 'an opportunity enabling contact,' as well as 'a kind of

6 "Crip Technoscience Manifesto," *Catalyst: Feminism, Theory, Technoscience* 5.1 (2019): 1-34.
7 Ibid, 5.
8 Ibid, 5.

attack.'[9] In the following analyses of the Bell System's accessibilities, as they appear historically and in textual representations, I argue that the telephone's technoscience is also always engaged in frictional access. The Bell System created a new kind of communicative access through its interconnected sonic network. Even as it attempted to place limits on its accessibility by controlling and standardizing the communicative bodies of its workers and subscribers, it also created access to resistance. The creation of a workforce of women telephone operators, for example, continually recalled the narrative of invention that the Bell System's corporate culture wished to repress, one which made disability and femininity powerful agents of creation and transmission.

The technoscience of the telephone encompasses all aspects of its development, from its roots in sonic experimentation and oralism, to its continued dependence on assistive technology for the deaf, to its network organization and commercial distribution, and finally to its representations as form of media technology. In acknowledging this wide range of media development I am enacting Jonathan Sterne's and Mara Mill's call to broaden disability's approach to media studies, not only taking into account textual and artistic representation of disability within media, but also "theor[izing] media change and technical design from a disability studies perspective."[10] Throughout this chapter, I interweave the telephone's media history together with two examples of its contemporary literary representations. In doing so, I consider the fact that fictional representations of inventors and operators, women and deaf/disabled people, are modified extensions of the Bell telephone system's real-world media

[9] Ibid, 10, Citing Fritsch, K. (2016), "Accessible." In K. Fritsch, C. O'Connor, & A. K. Thompson (Eds.), *Keywords for radicals: The contested vocabulary of late capitalist struggle* (23-28). Chico, CA: AK Press.
[10] "Dismediation: Three Proposals, Six Tactics," in *Disability Media Studies*, ed. Elizabeth Ellcessor and Bill Kirkpatrick, New York: New York University Press, 2017, 365-376, 366.

components. Literature about the telephone draws directly from the frictional accessibility of its technoscience, illustrating the same tensions between standardization and inclusivity that existed in real aspects of the telephone's commercial or technological development.

Mabel Hubbard Bell and "Ma Bell"

As I have argued, the narrative of Bell's invention of the telephone came to be defined by various accounts of "The Romance of the Telephone," repeated in various newspapers and biographical materials.[11] Popular rumor—created in part by previous narratives about women's aurality and d/Deafness— held that Bell created the telephone as a way to restore his wife's hearing. The Bell family distanced themselves from this narrative, which Mabel Hubbard Bell found to be deeply embarrassing because it disclosed publicly the fact that she was deaf, and because it was factually untrue.[12] Repeatedly, she arranged her family's biographical information to refute the story,[13] while simultaneously disavowing the deaf community or any mention of her own deafness as a form "of self-preservation."[14] Despite these actions, her deafness is integral to the media history of the telephone, and a clear signal of its frictional accessibility.

[11] Ellicott, 8.
[12] As Catherine MacKenzie, the Bells' personal secretary and later biographer, clarifies: "A popular version, however, has erroneously made the telephone a direct result of Bell's efforts to give hearing, or a substitute for hearing, to Mabel Hubbard. She was, of course, studying articulation under his direction during his early work on the telephone, and their later love affair was to influence profoundly the development of Bell's invention. But the first experiments to 'devise an apparatus that might help deaf children' were, by Bell's own account, initiated by his earlier work at the Horace Mann School. These experiments led directly to the speaking telephone" (56).
[13] MacKenzie seems to be protecting her former employers' privacy, going so far as to claim that "Mabel Hubbard was never Bell's pupil in the strict sense" (Ibid 55).
[14] Mabel Bell. Letter to Gilbert Grosvenor. 11 October 1921. Letters of Mabel Hubbard Bell, cited in *Mabel Bell: Alexander's Silent Partner*, Lilias M. Toward, Toronto: Methuen, 1984, 193.

Even prior to the patenting of the telephone and the development of the Bell system, Hubbard Bell's attitudes towards her own deafness played a key role in its technoscientific origins. Arguably, the evidence of her influence over her husband's early scientific success is accessible to us because of her deaf identity. Her preferred method of communication—even in-house—was written correspondence, which created a clear, "voluminous"[15] record of her involvement in technological innovation alongside her personal life. For example, as Bell was hesitating between further developing the telephone or continuing his father's work in Visible Speech, she steered her fiancé's endeavors according to her own wishes:

> You know what I think of the telephone, but you do not know what I think of Visible Speech. This has been the one subject that we have both avoided. You do not know how much this has troubled me at times […] I think it would be better if you made Visible Speech secondary to the telephone. All I want you to do is to work away at electricity at present[16]

She clearly had no desire for her future husband to continue his work in universalizing oral communication by way of his system of Visible Speech.[17] Even though her husband worked to popularize the idea that visible speech made oral language accessible to the d/Deaf, and possibly to her personally, she opposed this work. As a profoundly deaf woman she knew, undoubtedly,

[15] Brenda Jo Brueggemann, *Deaf Subjects: Between Identities and Places*, New York: New York University Press, 2009, 7.
[16] Hubbard, Mabel. Letter to Alexander Graham Bell. 26 July 1876. Letters of Mabel Hubbard Bell, cited in *Mabel Bell: Alexander's Silent Partner*, Lilias M. Toward, Toronto: Methuen, 1984, 31-32.
[17] In a much later letter, written at the end of her life, she clarifies that her antagonism is reserved in particular for oralist teachers of the d/Deaf: Of all people I hated most was a teacher of the deaf. I was always on the lookout for a little difference in their manner of addressing me, which would reveal the fact that I was a 'case' in their eyes" (Letter to Gilbert Grosvenor. 11 October 1921. Letters of Mabel Hubbard Bell, cited in *Mabel Bell: Alexander's Silent Partner*, Lilias M. Toward, Toronto: Methuen, 1984, 192).

of oralism's fundamental weaknesses as a form of accessible communication. Perhaps she even suspected that she would have likely been called to participate in or watch experiments and demonstrations of visible speech, just as she had during her own education, perpetuating her childhood experience as a model example of oralism's success.[18] She resisted this path, and instead chose to champion a form of technology that would be completely inaccessible to her because of her deafness, yet would create a greater form of accessibility through its effects on her life. The telephone, for Hubbard Bell, was a frictionally accessible form of technology: a form of technology completely inaccessible to her because of her deafness, but that was entirely legible to her as a product of oralist culture. Even if her disability barred her from using it, the telephone's development allowed her to ultimately live more comfortably, to control her family's finances, and to redefine actively the role that her deafness played in her life. It allowed her become maker of technology and not an imagined pretext for it.

Indeed, she maintained a significant amount of influence over the Volta Bureau's—later Bell Lab's—innovation and finances. She began with her majority control over the company's stock, a wedding gift from her husband, and she continued to invest in cutting-edge aeronautic technology.[19] As the Deaf/disability studies scholar Brenda Jo Brueggemann notes when she addresses Hubbard Bell directly in a melding of creative writing and disability criticism, "You made yourself, literally, a part of his experiments."[20] In her playful analysis of a 1903

[18] Ibid, 10.
[19] Mabel Hubbard received a majority share in the company as a wedding gift, when "Bell made over to his bride all his interest in the telephone" Mackenzie, *Alexander Graham Bell: The Man Who Contracted Space*, New York: Grosset and Dunlap, 1928, 100. She continued to invest influentially even later in the 20th century, when she contributed to some of the first developments in aviation by investing $35,000 from her own funds in order to found the Aerial Experiment Association (AEA) in 1907 (Brenda Jo Brueggemann, *Deaf Subjects*, New York: NYU Press, 2009, 137).
[20] Ibid, 137.

photograph, in which the couple poses, kissing, in front of an aeronautic prototype, she remarks, "Thirty-five thousand dollars of your own money! For this, you definitely deserve a kiss! We might think of you, then, as the first lady of aviation."[21] But where Brueggemann attributes Hubbard Bell's involvement her husband's experiments to her desire "to be together with him," and to mitigate his single-minded focus on his research, I argue that she is also continually re-negotiating her position in his experiments. In the popular imagination, she was presumably the figure of "Ma Bell": [22] a reincarnation of woman as acoustic device, a muse to inspire her husband's invention of the telephone, and an experimental subject upon which he projected his technological ambitions. She was the real-world embodiment of the intersection between gender and disability, an intersection that became the location for many imagined, anticipated forms of sound and communication technology. As a deaf woman who refused her deafness, she resisted these narratives and reshaped them into one of her own familial and technological making.

"The Automaton Ear"

As the telephone system continued to develop, and as textual representations of the telephone began to experiment with its cultural meaning, the intersection of deafness, disability, and femininity persisted. But even before the telephone's development, as I have argued, mid nineteenth-century literature relies on this intersection in order to enter the speculative mode, illustrating the link between women's auralities and future technologies. Remarkably, as we approach the date of Bell's first telephone patent in 1876, the specific link between deaf women and sound technology in speculative fiction crystallizes, announcing the imminent birth of this

[21] Ibid, 137.
[22] Avital Ronell, 280.

new technology. Florence McLandburgh's "The Automaton Ear," published by *Scribner's Monthly* in 1873,[23] is an uncanny anticipation of the popular narrative of Bell's invention of the telephone. It follows an unnamed professor and scientist who narrates his invention of the automaton and his experimentation using a deaf, female subject. The "deaf and dumb old crone," Mrs. Flinse, becomes the second test subject to wear the automaton ear after the professor himself, transforming into a "fiend" who will not relinquish the device. In this particular anticipation of the telephone and its relationship with female deafness, McLandburgh makes the issue of technological accessibility—specially who gains access to sound technology and to what effect—her central question.

It is remarkable to note the fictional professor and the real Alexander Graham Bell share a common sonic theory. Their experiments in sound technology rely on the diversity of human hearing as its variable, and the measurable presence of sound waves as its control. He formulates his experiment after reading a scientific treatise that inspires him:

> "As a particle of the atmosphere is never lost, so sound is never lost. A strain of music or a simple tone will vibrate in the air forever and ever, decreasing according to a fixed ratio. The diffusion of the agitation extends in all directions, like the waves in a pool, but the ear is unable to detect it beyond a certain point. It is well known that some individuals can distinguish sounds which to others under precisely similar circumstances are wholly lost. Thus the fault is not in the sound

[23] *Scribner's Monthly*, 5.6 (1873): 711-721. The short story was republished by Jansen, McClurg & Co as part of a collection, *The Automaton Ear and Other Sketches* (1876), a few months after Bell patented the telephone in February of the same year. This was the only literary work published under the author's name, Florence McLandburgh, although she later went one to write extensively as a newspaper humorist under the name McLandburgh Wilson. Under her pseudonym, she published a volume a humorous, patriotic WWI poetry, *The Little Flag on Main Street* (1917).

itself, but in our organ of hearing, and a tone once in existence is always in existence."[24]

In imitating the style of earlier 19th-century sonic theory,[25] McLandburgh emphasizes the immortality, symmetry, and stability of sound over the varying and faulty human ear. Unsurprisingly, it is the capacity of sound never to be lost, to "vibrate in the air forever and ever" that captures the professor's attention and inspires him to "construct an instrument which could catch these faint tones vibrating in the air and render them audible."[26] Strikingly, this earlier, fictional narrative of invention resonates closely with Bell's much later, real-life speech, where he describes his goal to "render visible to the eyes of the deaf the vibrations of the air."[27] But even more striking is that this fictional conception of sound, whereby it is understood as a constant vibration, should be so limited by the faults of the human ear. In conceiving of sound as timeless and universal in its natural form, only limited by human perception, the professor invents a lack of accessibility to full sonic experience, disabling implicitly even himself and

[24] Ibid, 711.
[25] Melissa Dickson remarks that the professor's reading "bear[s] a remarkable resemblance to Charles Babbage's reflections in his 1838 chapter 'On the Permanent Impression of Our Words and Actions on the Globe We Inhabit.'" *Sound Knowledge: Music and Science in London, 1789-1851*, ed. James Q. Davies and Ellen Lockhart, Chicago: Chicago University Press, 2016, 142.
[26] "The Automaton Ear," 712. Again, McLandburgh's language echoes that of Charles Babbage: "The waves of air, although in many instances perceptible to the organs of hearing, are only rendered visible to the eye by peculiar contrivances; but those of water offer to the sense of sight the most beautiful illustration of transmitted motion. Every one who has thrown a pebble into the still waters of a sheltered pool, has seen the circles it has raised gradually expanding in size, and as uniformly diminishing in distinctness." "On the Permanent Impression of Our Words and Actions on the Globe We Inhabit," in *The Ninth Bridgewater Treatise* (1837), Cambridge: Cambridge University Press, 2009, 114.
[27] "Growth of the Oral Method of Instructing the Deaf." 10 November 1864, Horace Mann School, 25th Anniversary Address. Reprinted in *The Annual Report of the Committee on the Horace Mann School*, Boston: Press of Rockwell and Churchill, 1896.

other hearing people. In its attempts to harness sound's immortal capacity, the professor's automaton ear depends on an invented form of deafness, much like the telephone.

McLandburgh's narrative of invention relies on a representation of deafness as the boundary between abstract conceptions of sound and its embodied materiality, between the inspiration of the natural world and institutional forms of knowledge. The professor receives his intellectual breakthrough by removing himself from his "'study,' as the students called my small apartment, leaving it for one bounded by no walls or ceiling."[28] Within the unbound space of nature, which "rang with the hum and chirp of insects and birds,"[29] he reads the sonic theory of the scientific treatise, becoming so distracted by his new idea to create the automaton ear that, on the way back to the university to begin his experiments, he "cannot recollect anything" except "Mother Flinse, the deaf and dumb old crone […] standing the gateway."[30] Here, the author displaces deafness from an implicit and generalized form, into the literal form of a deaf and mute character, Mother Flinse, a concrete evolution of the metaphorical deafness that appears more frequently in earlier literature. She functions as a gatekeeper between scientific theory and its technological enactment, as only after passing her and seeing "her long, slim shadow that lay on the path,"—her body in its material and transient forms—does the professor come up with the actual, material beginnings of the automaton ear—the ear trumpet. He remarks, "I went down to London and purchased a common ear-trumpet […] I had only to improve upon this instrument; careful study, careful work, careful experiment, and my hopes would undoubtedly be realized."[31] The ear trumpet—an eighteenth-century technology designed to improve the accessibility of

[28] "Automaton Ear," 712
[29] Ibid.
[30] Ibid.
[31] Ibid, 713.

sound to the deaf—becomes the basis for a more advanced technology that creates unlimited accessibility to sound for the hearing. The similarity between this fictional account of the invention of automaton ear and the "Romance of the Telephone" is far from coincidental. The automaton ear and the telephone both rely on a common sonic theory and a common narrative—this is an anticipatory, fictional version of Bell's attempts to "render visible to the eyes of the deaf the vibrations of the air," and the popular narrative where his invention results from his attempts to accommodate his wife's deafness. McLandburgh foregrounds an older, cultural, and literary understanding of the feminine, disabled origins of sound and communication technology, an understanding that came to pass and that persisted despite attempts to erase it from the telephone's cultural memory.

McLandburgh's story is also a meditation on the friction between Mother Flinses's deafness, which enables the automaton ear's material realization, and actual forms of accessibility that the automaton ear grants both hearing and deaf users. This text is an early, literary examination of the conflicts between the dependence of technology on disability and technology's actual accommodation of disability. The professor situates the ear-trumpet and the automaton ear on an escalating spectrum of hearing ability, where at one end of the spectrum the ear trumpet reveals its capacity to amplify sound to an even greater degree when the user is hearing, and the augmented automaton version of it is able to grant him the ability to hear across vast distances, and even perform a kind of sonic time travel. The imagined capabilities of the automaton ear become terrifyingly limitless; as the professor continues to listen through it, he hears sailors a hemisphere away, concerts that have long since ended, hushed, private conversations between mothers and children. He begins to perceive the world he hears with the naked ear as lifeless, and people with un-augmented hearing as "deaf forever save to the few

transient sounds of the moment."[32] The automaton ear reveals to the inventor his place on this spectrum of deafness and disability, where he becomes super-hearing, hearing people become deaf, and where deaf people slide off the acoustic scale entirely. However, the disability he perceives in others begins to turn back onto himself, as his augmented hearing abilities soon begin to take a profound physical and mental toll, effectively rendering him both "sick" and "crazy."[33] The unlimited accessibility of sound has become in effect disabling to its hearing inventor. In other words, the technology's origins in disability accommodation have evolved into an inevitable disabling of an otherwise able-bodied user. McLandburgh further explores this idea when she switches towards exploring the implications the automaton ear might have for the deaf person who enabled its material production.

Filtered through the professor's first-person narrative, McLandburgh's readers receive an ambiguous lesson on accommodating or even curing deafness through technological means, the ethics of using disabled and/or disenfranchised experimental subjects, and the nature of access to technology for disabled people. She frames the professor's choice to test the automaton ear on Mother Flinse as a continuation of the inventor's monomania and narcissism, implying that his treatment of the deaf woman is unethical. Suspecting that his extraordinary auditory experiments may in fact be a symptom of insanity, "merely the creation of my diseased fancy, and the instrument I had handled useless metal," the professor seeks out another experimental subject. He immediately settles on Mother Flinse, for she "was mute. I might get her to test my invention without fear of betrayal, for she could neither speak nor write, and her signs would be unintelligible to others."[34] Here, he moves away from the "inventive" aspect of her disability—

[32] Ibid, 715.
[33] Ibid, 716.
[34] 717.

her inspiring deafness—which he represses under a misguided perception of her disability as limiting. Her muteness presumably excludes her from a communicative economy that would threaten his intellectual property, reassuring his desire to remain isolated with his invention. Moreover, her deafness is an opportunity to experiment with the automaton ear's greater possibilities: "The instrument ought to, at least it was possible that it might, remedy loss of hearing. I too was deaf to these sounds in the air that it made audible. They would have to be magnified to a greater degree for her."[35] By connecting 'curing' with 'magnifying', the professor seeks to align his invention with the objectiveness he ascribes to sound in order to distance it from the erracticness and particularity of the human ear. Whereas his desire to involve of Mother Flinse in his experiment in order to cure her disability might be understood as a kindness or charity, especially so in the late nineteenth-century, McLandburgh casts aspersions on this motivation. The professor visits Mother Flinse's "hovel," expressing great disgust at her poverty and poking fun at her bedraggled appearance, her age, and her signing. He lies to her, lures her into his workshop by requesting her services as a maid, and coerces her into raising the automaton to her ear. As such, her first use of the instrument is less a scene of access, than it is of technological violence. Upon coercing the rightfully suspicious Mother Flinse into wearing the automaton, she is instantly transformed, possessing at once an "unearthly beauty" and a terrifying monstrosity as she, presumably, not only hears for the first time, but also gains direct access to its extraordinary auditory capabilities. She attempts to steal the device for herself, and the professor stops her by snapping her neck.

This violent act, in which the professor's insincere attempt at disability inclusiveness backfires spectacularly, relays the danger of repressing the disabled origins of communication

[35] Ibid.

technologies. Because he represses this part of his technological narrative, it is revisited upon him in the form of his own disabling, and in the form of Mother Flinses's monstrous transformation. The professor's murder of the deaf woman, over which he explicitly denies feeling guilt, points to McLangburgh's implicit condemnation of his rejection and repression of disability. The author's own acknowledgment of deafness, appearing at the threshold of an inventive space and at the violent conclusion of her narrative, points to her interpretation of this disability as a necessary yet volatile part of technological accessibility.

Women Telephone Operators: Embodying Access

Another potentially volatile point of access between the telephone as a technology and its users were women telephone operators, who simultaneously embodied and dismantled fantasies of perfect technological functionality. These laborers represented the contradictory nature of the telephone's accessibility: designed to connect directly one user to another, but requiring the use a third party, whether human or machine, to facilitate or mediate that connection. As Michèle Martin argues,

> telephone operators were placed in a paradoxical situation: they represented both a necessary element in and an obstacle to the production of instantaneous private interactive communication. Before the adoption of the automatic switchboard, they were essential to making connections between subscribers, but as 'human mediators' whose activities could delay or intrude on the privacy of telephone calls, they were obstacles to the development of the telephone service sought by the companies. The telephone companies attempted to produce operators with

particular habits, skills, and attitudes. This led to the feminization of the operator labor force. [36]

Martin's chain of events, whereby the status of operators as "human mediators" of the telephone led to a globalized system of almost entirely female operators by the 1880s, is the focus of recent scholarship on women telephone operators and their representations in literature. Later scholars have recognized that the choice to employ women as operators was part of a larger project to standardize language.[37] Jennifer Janechek asserts that "after the invention of the telephone, women became the mouthpieces of empire, disseminating linguistic standards through their adherence to and reproduction of standard English," a form of standard English that becomes, eventually, the "telephone voice."[38] These linguistic standards were a continuation of what Friedrich Kittler describes as the "mother tongue," where, according to Janechek, "women were largely responsible for disseminating the newly oralized alphabet and its preferred method of propagation, phonemic reading."[39] Janechek also makes the rightful connections amongst Kittler's "mother tongue," the later development of the "telephone voice," and their intermediary, Bell's Visible Speech, which George Bernard Shaw uses as inspiration in *Pygmalion* (1912). There is an important clue in *Pygmalion*, since not only is it "a narrative of

[36] *"Hello, Central?": Gender, Technology, and Culture in the Formation of Telephone Systems*. McGill-Queen's UP, 1991, 50.
[37] Martin herself does not fully answer this question of cause and effect. She attributes the choice of employing women operators to a feminization and devaluation of labor, which in fact according to Venus Green did not occur until much later in the 20th century. *Race on the Line: Gender, Labor, and Technology in the Bell System 1876-1980,* Durham: Duke University Press, 2001, 7.
[38] "*Gendered Information Networks and the Telephone Voice in Shaw's* Pygmalion *and* Village Wooing," *Texas Studies in Literature and Language*, 60.1 (2018): 32-55, 33. "The telephone companies' efforts to enhance clarity of communication along the wires coalesced in what came to be known as the "telephone voice," a mode of speaking taught to operators that followed specific rules of articulation," 36.
[39] Ibid, 34.

auditory training similar to that required for switchboard operation,"[40] but also a narrative identical to Mabel Hubbard Bell's oralist education, which included Visible Speech, and more broadly to oralism as a general pedagogical practice. Tracing back the telephone operator's training in standardized speech is once again a process of recovering the telephone's origins in deafness. Therefore, investigating the mediatory nature of the telephone operator requires an intersectional approach, recognizing both the women's role as mouthpieces and pupils of standardized English, as well as disability's role in destabilizing that standardization.

Indeed, when we examine the practices of hiring and training women telephone operators we can see evidence of its negotiation with disability, as well as other forms of intersectional identity such a race, class, and national origin. Although the telephone represented, as Lana F. Rakow points out, the potential of "transcending time and equalizing social hierarchies," which led Marshall McLuhan to describe the telephone as a "dialog only among centers and among equals,"[41] the Bell telephone system was more concerned with embedding elements of social control and discrimination within its technology and labor practices. In her comprehensive history of the Bell system *Race on the Line,* former AT&T technician and media history scholar Venus Green argues that the company defined skill purposefully along gendered and racial lines in order to control their workforce. "During the first sixty years of telephony, skill was not defined only in terms of training and experience, but also as a matter of gender and race. Like waitresses, saleswomen, and a majority of clerical workers before World War II, white skin and the idealization of its meaning significantly determined skill for telephone operators."[42] The predominately female workforce of telephone operators was entirely white, also excluding

[40] Ibid, 33.
[41] *Race on the Line,* 2-3.
[42] Ibid, 2.

immigrants, Jews, and women with "chronic disorders."[43] By the first decade of the 20th century potential operators received physical examinations, adhering to physical standards of able-bodiedness which included vision, hearing, height, and age.[44] The labor history of the Bell system, therefore, is marked by conflicting points of access and inclusion, where the creation of opportunities for white women as skilled operators came at the price of excluding Black, disabled, and immigrant women. As such, when we think of the Bell System's provision of a historically exceptional opportunity for women to gain technological skill, employment, and independence, we should also think about which women were allowed access to this opportunity, and what cultural material they actually mediated and transmitted as telephone operators. Because the company chose these women workers according to white supremacist standards, women who "possessed the social characteristics and skills that the Bell System required to monopolize the business"[45] and homogenize language, the nature of all telephone exchanges included an element of systemic racism and social control.

However, even in its discriminatory, homogenizing hiring practices, the Bell telephone system struggled to maintain control over its growing, powerful workforce. Corporate control's struggle over actual telephone operators parallels the resurgence of disabled or disruptive female, sonic mediators within literary representations of the technology. In the late nineteenth century, the increasing number of subscribers and demand for long distance telephony required a simultaneous increase in the workforce population and in technological innovation. As a result, "engineers designed new switchboards that often increased the number of operators or enhanced

[43] Ibid, 64-66.
[44] Ibid, 66.
[45] Ibid, 64.

their skills,"[46] granting women operators a significant amount of control over the technology and their place in the company. Throughout the late 19th-century and early 20th-century, continuing through WWI, women operators went on strike successfully to insist upon better pay and working conditions.[47] But as Green argues, these workers were limited in their ability to advocate for themselves effectively because of their embrace of the white supremacist values of the company. The company's discriminatory hiring practices allowed these women the privilege of accepting "the moral, pious, virtuous identity of the 'white lady' image,"[48] which effectively "inhibited the development of feminist working-class consciousness among white women."[49]

Indeed, the location of their feminist working-class consciousness was limited to gender and more significantly disability. White women operators won cases against their employers based on claims of physical harassment and injury. For example, the "hello girl" Eva Cook won a settlement of $12,500 in 1903, after a becoming permanently injured from being "caught beneath the switchboard" after a male company official "grasped her by the shoulders and whirled her violently around" while she was sitting on "a high revolving stool."[50] Cook's case is a clear example of how the technological environment that enabled her to do her job—the switchboard, the high revolving stool—were inappropriately used against her, in direct violation of the unity that workers were supposed to achieve with their equipment. Union advocates also used this rhetoric when they observed that telephone operators had particularly severe cases of

[46] Ibid, 6.
[47] After WWI, "the Bell System waged a deliberate campaign to reduce their operating force and to gain greater control over the work process." By contrast, "nineteenth-century engineers designed new switchboards that often increased the number of operators or enhanced their skills," granting this labor force more control over the technology and their place in the company. Ibid, 6.
[48] 91
[49] 3.
[50] "Damages for Telephone Girl," *Telephone Magazine*, ed. John R. Dare, 21 (1903): 113.

workplace exhaustion and strain due to the long hours and sensory overload that characterized working in a telephone exchange. Josephine Goldmark, known for her work on the committee investigating the Triangle Shirtwaist Factory Fire, completed an exhaustive account of the disabling conditions inside telephone offices in *Fatigue and Efficiency* (1912).[51] She argued that "the simplest form of the telephone connection […] gives us some insight into the prodigious strain of this occupation upon the special senses,—sight, hearing, touch,—as well as the muscular exertion of reaching high up and to the side."[52] Gathering testimony from physicians and specifically targeting the Bell System, Goldmark documented the physical effects of operating the telephone for long, interrupted hours, which included nervous breakdowns, fatigue, headaches, eye strain, and even deafness.[53] Goldmark's work forced telephone companies to recognize how the embodied nature of laboring at the switchboard was disabling in and of itself, allowing telephone operators to advocate, sometimes successfully, for labor reform. Even as mediators and transmitters of standardized language and white supremacist culture, it was women operators' physical bodies that interrupted the fantasy of the direct, seamless, and equalizing communicative connections imagined in the telephone. As such, they became figures of cultural and technological resistance even as they were employed to perform functions of cultural and technological control.

"The Chief Operator"

[51] *Fatigue and Efficiency: A Study in Industry*, New York: Charities Publication Committee, 1912.
[52] Ibid, 47-48.
[53] Ibid, 547.

Published by *Harper's Monthly Magazine* 1909,[54] Elizabeth Stuart Phelps's short story "The Chief Operator" is an exploration of modern technology's intersection with older forms of feminine mediation. She draws her source material from the real-life story of Sarah Rooke, who sacrificed herself by staying at her switchboard in order to warn the townspeople of Folsom, New Mexico, of a flash flood.[55] Similarly, Phelps's heroine, Sarah Raven, uses her position of authority in the telephone office in order to countermand demands that she flee to safety, choosing instead to save her community, particularly its disabled, elderly, and sick members. In the context of telephone companies' rigorous attempts to control the bodies and cultural transmissions of its women operators, April Middeljans reads this short story as "grappl[ing] with this question of whether a heroic adherence to 'duty' empowers or enslaves the operator."[56] In other words, what is the nature of Sarah Raven's agency, if she is both controlled by her occupation while also using it as a form of resistance? Is she the target of technological control or is she a technological creator herself? I argue that her position functions in the context of frictional access, which allows for both these positions within the telephone's technological system to exist in conversation with one other. I also read this short story in terms of its literary predecessors and their engagement with sound and mediation, mainly that of George Eliot's *Mill*

[54] "The Chief Operator," *Harper's Monthly Magazine*, July 1909, 300-308. The story was later republished in a collection of short stories a few months later, including the illustrations from *Harper's Monthly Magazine*, entitled *Oath of Allegiance.* Boston: Houghton Mifflin, 1909.
[55] "Girl at Telephone Died for Others." *New York Times* 30 Aug. 1908, cited in "'Weavers of Speech': Telephone Operators as Defiant Domestics in American Literature and Culture," April Middeljans, *Journal of Modern Literature,* 33.3 (2010): 38-63, 44.
[56] Ibid, 44. Middeljans also gives a critical overview of the short story as it appears in past scholarship: "The meager literary criticism on this obscure story is contradictory. Carol Farley Kessler complains that 'Phelps seems to advocate self-sacrifice as a satisfying stance,' while Lori Duin Kelly argues that the telephone operator is one of the few 'strong' and independent women in Phelps's fiction after 1877."

on the Floss (1860), and Phelps's fictional portrayals of spiritualism. Sarah Raven is between the past and Phelps's contemporary moment, both a throwback embodiment of previous forms of feminine sonic mediation, as well as a modern, evolutionary representation of the telephone's increasing technological control.

Her occupation as a telephone operator, in the context of other commercial and literary representations of the profession, signals that Sarah is at the interpretive center of Phelp's short story. This fictional position resists the real-life efforts of the early Bell Telephone System, which sought to eradicate the unsettling idea that operators played a creative role in reshaping their transmissions. For example, a 1915 ad campaign entitled "Weavers of Speech" illustrates the operator's passive role in communication: "Upon the magic looms of the Bell System, tens of millions of telephone messages are daily woven into a marvelous fabric […] Out of sight of the subscribers, these weavers of speech sit silently at the switchboards, swiftly and skillfully interlacing the cords which guide the human voice."[57] As Middeljans asserts in her analysis of the role of the operator within this text, "the ad reduces her to a set of 'invisible hands' relaying 'a dramatic story' in which she never participates."[58] I would observe that this reduction into a passive role occurs even at the grammatical level; the ad's passive voice writes the operators out of their actions, displacing the verbal emphasis onto "magic looms" and "cords." The technological apparatus of the telephone, metaphorically transformed into textile equipment, becomes the center of linguistic action, and the focus of all mediation and interpretation. Out of the hands of corporate control, however, the role of the woman operator establishes itself as the center of meaning within texts, even acting as a stand-in for the position of author and/or reader.

[57]"Weavers of Speech."American Telephone and Telegraph. Advertisement. Dec.1915. Box 2061, AT&T Archives (Warren, NJ), cited in Middeljans.
[58] Middeljans, 40.

These characters function as their literary ancestors did, but rather than enacting an anticipation of future technologies, they enact the raw power of narrative and linguistic possibility. Across other examples of literary telephone and telegraph operators—such as the infant Hello Central in Mark Twain's *A Connecticut Yankee in King Arthur's Court* (1889) and the unnamed telegrapher in Henry James's *In the Cage* (1898)—these characters function clearly as generators of creative potential.[59]

Indeed, by returning to the Bell Telephone System's portrayal of women operators as "Weavers of Speech," we can begin to see the "chief operator's" creative, as well as destructive, potential. Middeljans argues that this textile metaphor has the capacity to turn on its corporate culture. She contends that commercial attempts to downgrade the woman operator into a "paragon of docile femininity" has its flip side, since the metaphor of female weavers also prefigures the Greek Fates, whose power over spinning, measuring, and cutting the threads of fate determines who lives and who dies.[60] I contend that this observation has particular relevance in "The Chief Operator," as Phelps refers repeatedly to Sarah Raven's "head-receiver," which "gave a Greek look to the American working woman." After saving the lives the townspeople and sacrificing herself, she maintains her goddess-like appearance even when her body is found ten miles downstream in the river: "The head-receiver, with its Greek look, was still fastened

[59] Sean Keck argues that Twain's portrayal of the early telephone in metaphorical infant form "celebrates its linguistic potential energy, an energy ironically lost when the medium achieves standardization" ("Literary Regionalism and Mark Twain's Telephone," *The Mark Twain Annual*, 15 (2017): 106-125, 108). According to Jill Galvan, Henry James's telegrapher has too much creative potential, as her faulty readings of telegraphic messages becomes "a species of automatic writing," relying on the same conjuring "out of thin air" that Victorian mediums used to mislead their audiences (*The Sympathetic Medium: Feminine Channeling, The Occult, and Communication Technologies, 1859–1919*, Ithaca: Cornell University Press, 2010, 42).
[60] "Weavers of Speech," 41.

upon her bright hair."[61] In her literary representation, the fictional telephone operator is far closer to terrible power of the Greek Fates than she is to a passive, domestic "weaver of speech."

We can also identify the nature of Sarah Raven's agency in her professional title, which is not a mere telephone operator but is in fact the titular "chief operator." Here, Phelps reveals her knowledge of the inner workings of the Bell telephone system, as this title was specific to privileged, mediating class of professional women. The title of "chief operator" refers to a specific moment in the company's history, when "upper management instituted a more distinct hierarchy to enhance the image of authority and to distance the managers from the operators."[62] A chief operator acted as a conduit between regular operators and management, monitoring the language and procedure of operators and reporting back to the manager, as well as granting operators permission to leave the switchboard.[63] It was a prestigious position which women could achieve only after a significant time served as a regular operator, once which "placed demands on their intelligence and judgement," and which "brought these operators better pay, and real levels of advancement and responsibility."[64] Phelps's fictional portrayal of Sarah Raven, who is both a young widow and a chief operator, preemptively announces her moral, experiential, and professional authority over that of a mere telephone operator. She has oversight over two other operators, two "girls" named Molly and Mary, who reinforce the heroine's professional agency because of their regard for her, "held in respect […] not only for a certain

[61] "The Chief Operator," 308. Phelps borrows these details directly from the *New York Times* article, which specifies that the real-life Sarah Rooke was found "twelves miles down the cañon. The headpiece worn by telephone operators still gripped her ear" ("Girl at Telephone Died for Others").
[62] Green, *Race on the Line*, 48.
[63] Ibid, 49.
[64] Ibid 61-62.

power to enforce official authority, but because she was a married woman."[65] And indeed, Sarah performs all the duties of a real-life chief operator, down her emergency response to the oncoming flood. While Molly and Mary react by "flitting and screaming like the flock of birds swaying outside the window—little beings seeking shelter from fate," Sarah—who embodies, as we have seen, Fate itself—"put[s] out her hand for her official directory," dismisses the "girls" from their switchboards, and refuses their pleas to escape with them, stating that "I have my subscribers to think of first."[66] Modeling the ideal chief operator down the rulebook, the heroine's professional title grants her access to own heroism, reprising the role of other female, sonic rescuers—Jane Eyre and Maggie Tolliver—but with a new, official mastery of sonic technology.

Sarah Raven's professional sacrifice also has literary antecedents which inform the nature of her telephony. In many ways this self-sacrificing heroine, drowned in a flood as she attempts to rescue her family and community, is the technological descendant of Maggie Tulliver in *Mill on the Floss* (1860), who similarly attempts to rescue her brother and extended family from flooding. I argue that Phelps's short story may in fact be a direct reference to George Eliot's novel, especially since they, in addition to Harriet Beecher Stowe, are part of a well-recognized literary collective who "were in direct correspondence with each other from the mid-1860s until Eliot's death in 1880."[67] As Jennifer Cognard-Black argues in her study of the transatlantic, professional relationships amongst these three bestselling woman authors, both Stowe and Phelps collaborated on an "all-encompassing feminine aesthetic with Eliot as their mutual paragon."[68]

[65] "The Chief Operator," 300.
[66] Ibid, 302.
[67] Jennifer Congard-Black, *Narrative in the Professional Age: Transatlantic Readings of Harriet Beecher Stowe, George Eliot, and Elizabeth Stuart Phelps*, New York: Routledge, 2004, 4.
[68] Ibid, 4.

After Eliot's death, Phelps eulogized her in the poem "George Eliot—Her Jury," where she proclaims Eliot's "immortal" influence.[69] Given the lasting strength of Eliot's literary impact on Phelps, it is possible that Sarah's mediation of "the disability in the current"[70]—the scrambled telephonic signals that result from the storm—is a reprisal of Maggie's navigation of the disorienting "new tidal current"[71] brought on by the flood. Previously I argued that Maggie becomes the embodiment of a soundwave during the process of her physical and sonic drowning. So too does Sarah, who similarly transforms into the sonic, technological media that employs her: "The young woman sat at her post like a figure carved from the switchboard, a creature born of the thrill and power of modern life."[72] A technological continuation of the mid nineteenth-century female, sonic mediator, Phelps's "chief operator" fulfills the promise of Eliot's futuristic, speculative fiction.

Phelps's short story is also a clear extension of her own body of work and its particular brand of late nineteenth-century feminist spiritualism. Previous critical interpretations of the story have that have taken into account Phelps's literary career as a whole have focused solely on the heroine's status as a feminist figure, asserting that the central character either falls flat or exceeds the agency of Phelps's previous fictional women.[73] Most recently, Middeljans has combined Phelps's little-known short story with the cultural history of the telephone, concluding that "her autonomy is hobbled not by company protocol but by nature itself, and thus her

[69] *Elizabeth Stuart Phelps: Selected Tales, Essays, and Poems*, ed. Elizabeth Duquette and Cheryl Tevlin, Lincoln: University of Nebraska Press, 2014, 194.
[70] 301.
[71] *The Mill on the Floss*, 479.
[72] 303.
[73] See Carol Farley Kessler, *Elizabeth Stuart Phelps*. Boston: Twayne Publishers, 1982, p. 118 and Lori Duin Kelly, *The Life and Works of Elizabeth Stuart Phelps, Victorian Feminist Writer*. Troy, NY: Whitston, 1983, p. 15.

perseverance at her post represents rebellion rather than subservience."[74] She argues further that the figure that Sarah Raven establishes—the self-sacrificing telephone operator who sticks to her post in the midst of a disaster—functions as a literary trope in later, twentieth-century textual renditions. Such a role "grants the operator a measure of independence and bravery that cannot be entirely explained as the product of industry indoctrination, nor co-opted by industry rhetoric of the spirit of service." Although they account for the short story's engagement in feminism and media culture, none of these critical interpretations have yet considered the role that spiritualism plays in justifying the chief operator's self-sacrifice, or how it informs her technological mediation.

Spiritualism, Mediation, and Disability

Similarly to Eliot's work that I discuss in a previous chapter, Phelps invests her fiction in the idea of life-after-death. However, whereas Eliot's engagement with a continued, technological afterlife is concerned with futurity, with what happens after her narratives' conclusions, Phelps's preoccupation with the afterlife is about the mediation between life and death in the present moment of her writing. "For Phelps, death is not final at all," argues Cindy Weinstein. Indeed, "the claim that death does not really separate the living and the dead" is the "donnée" of Phelps's bestselling novel.[75] Forty years before the publication of "The Chief Operator," Phelps's *The Gates Ajar* (1868) invented a new, highly influential type of mourning in the wake of the Civil War, one which relied on women as mediators between life and death

[74] "Weavers of Speech," 45.
[75] Cindy Weinstein, "Heaven's Tense: Narration in *The Gates Ajar*," *Novel: A Forum on Fiction*, 45.1 (2012): 56-70, 56-57.

and which introduced access to a material, manifested heaven.[76] Through the character of Winifred, who "becomes the novel's theological mouthpiece,"[77] Phelps creates a conduit between heaven and earth, the dead and the living. Soothing the grief of other characters, mainly her niece, Mary, whose brother has died recently in the war, Winifred theorizes that heaven is both a corporeal and materialistic dimension that can be made accessible to the living through their faith in God.[78] Both Lisa A. Long and Lucy Frank observe that this theory of the afterlife coincides historically with the rise of spiritualism in America after the Civil War. As Frank puts it, "in presenting such a detailed vision of an embodied heavenly existence, Phelps is clearly indebted to the spiritualist movement."[79] Winifred's conjuring of a materialized heaven in the religious imaginations of her family and community resembles the work of "séance leaders [who] acquired fame for producing palpable objects out of thin air (or more precisely, as believers asserted, out of the domain of spirits)."[80] However, her role as a spiritual mediator, one which

[76] In order to perform this literary and cultural innovation, Phelps had to perform a religious intervention, "breaking […] the taboo on speculation about the afterlife which dominated American Christianity at that time." Elizabeth Stuart, "Elizabeth Stuart Phelps: A Good Feminist Woman Doing Bad Theology?" *Feminist Theology*, 9.26 (2001): 70-82, 79. Stuart cites Phelps's contemporary, who spoke highly of *The Gates Ajar*'s theological reshaping: "Like most books that have had positive and helpful influence, it originated in honest questioning and honest search. There had long brooded over the church of America and England, the shadow of prescribed silence on everything relating to the future life. Speculation had been frowned upon, as baseless and irreverent, hope had been forbidden to think, and the 'better land' lay far off in the frozen mist of negative and unreal glory" (Elizabeth T. Spring, "Elizabeth Stuart Phelps," in *Our Famous Women: An Authorised Record of their Lives and Deeds* (Hardford: A.D. Worthington, 1883), pp. 560-79 (567).
[77] Lisa A. Long, "'The Corporeity of Heaven': Rehabilitating the Civil War Body in *The Gates Ajar*,": *American Literature*, 69.4 (1997), 781-811, 791.
[78] See Lisa A. Long, "'The Corporeity of Heaven': Rehabilitating the Civil War Body in *The Gates Ajar*,": *American Literature*, 69.4 (1997), 781-811, and Lucy Frank, "'Bought with a Price': Elizabeth Stuart Phelps and the Commodification of Heaven in Postbellum America," *ESQ: A Journal of the American Renaissance*, 55.2 (2009): 165-192.
[79] 178.
[80] Jill Galvan, *The Sympathetic Medium*, 42.

relies on genuine faith rather than proof of authenticity,[81] operates at the center of a religious network rather than openly spiritualist one, as she eventually converts even the most resistant local minister, Mr. Bland. Within the context of these emergent theological ideas about mourning and the afterlife, Winifred is not only a "theological mouthpiece," but also a kind of "chief operator." She rescues her family and community from an isolating experience of mourning by connecting them to a new image of heaven, and performs a type of self-sacrifice by passing along messages to loved ones on her own deathbed, in effect rehearsing the actions of Phelp's much later heroine.

By reading Winifred as another prototype for Sarah Raven, the "chief operator," we can begin to see how this short story also evolves out of spiritualist theology in addition to anticipatory sonic theory. Sarah's appearance as a metaphorical Fate auditions the privileged position of women within invisible spiritualist networks. In the same way that the chief operator sees the electronic threads that form the fabric of Earthly life, Phelps imagines herself as being able to find the spiritualist threads that organize the afterlife. As Jill Galvan argues in her study of the parallel development of spiritual and technological mediums in the nineteenth century, "On both sides of the Atlantic, spirit channeling quickly became marked as feminine. What is striking […] is that the development of female mediumship parallels women's increasing involvement over the course of the period in technological modes of communication mediation."[82] Indeed, Sarah represents both of these mediating types in her dual existence as

[81] Here I paraphrase Nina Baym's preface to *The Gates Ajar* in *Three Spiritualist Novels*, where she clarifies that "unlike the Spiritualists whose belief rested on a material occurrence whose authenticity they accepted, Phelps argues not only for the particularities of her vision but for the requirement that it remain a matter of faith" (xx). *Three Spiritualist Novels*, ed. Nina Baym, Urbana: Illinois University Press, 2000.

[82] 4.

telephone operator and widow. The day of the storm is also the date of her wedding anniversary, for which she ineffectually mourns: "From the pang of it she tried to forget, and then for the love of it she determined to remember, and then she dashed forgetting and remembering from her and whirled upon her revolving chair. There was a sudden acceleration of demands upon the exchange."[83] Two types of mediation are present here; her vacillation between manifesting and erasing her grief over her husband, and her occupation as a telephone operator. In the moment where her heroine wavers between remembering the dead and connecting to the living, Phelps accelerates the "demands upon the exchange," both a literal reference to the amount of calls coming in due to the storm, and a metaphorical description of Sarah's overloaded psyche. Her wedding anniversary represents a spiritual boundary between life and death echoed by the escalating storm outside, creating a communicative, accessible portal.

Because Sarah functions as both a spiritual and technological medium, she is able to bend the telephone network to her will and prioritize who she rescues. Although it would appear that she simply calls her subscribers as they appear on her list, Phelps's characterization of these calls reveals that these telephone owners all have something in common: some type of physical vulnerability in themselves or their family members. As the telephone system breaks down, revealing the "disability in the current,"[84] or the sonic interference caused by the storm, Sarah also begins channeling disability: "With the swiftness of a sympathetic operator in a country exchange where she knew everybody and everybody knew her, she recalled the circumstances of her subscribers—who was sick, who was incompetent, who was hysterical, who had no man in the house."[85] The imbedded disability of the telephone system—located in both its origins in

[83] 301.
[84] 301.
[85] 303.

deafness and its technological vulnerabilities—extends into Sarah's network of subscribers. Far from simply going down an alphabetical list, she makes decisions, even amongst those privileged enough to have a telephone in their homes, about who needs her help most. She creates a specialized technological accessibility, where the commercial strategy of the real telephone system, which sought out wealthy homeowners as customers, is rewritten as a system based on physical and social need. As chief operator she remakes the telephone system into one that prioritizes disabled people: a "bedridden mother;" "the old grocer;" "a little boy down with scarlet fever;" a newborn; a drunk.[86] The wires eventually become entirely disconnected, but "it comforted her to believe that all the sick people had been told in time."[87] Although it might be easy to dismiss this list of physical ailments as sentimentalized, a criticism that is often leveled at Phelps, disability is particularly meaningful in this media context. In the hands of Sarah Raven, the telephone—by early twentieth century a clear commodity—is no longer an exclusive point of access, but is rather a direct conduit to disabled users. Surrounded by her literary ancestors who similarly conducted soundwaves and spiritual callings in order to come to the rescue of their fellow human beings, the "chief operator" saves her disabled community, and, in doing so, recovers the disabled past of the telephone itself.

[86] 303-305.
[87] 306.

Conclusion

Crip Ancestry, Crip Inheritances: Why the Telephone Still Matters for the d/Deaf Community

Stacey Milbern, a prominent queer, Korean, disabled activist and writer, inherited a pair of boots.[1] "These boots were worn by two of my personal heroes, crip elders who became crip ancestors when they passed," Milbern writes. First was "Harriet McBryde Johnson, an American writer and disability rights attorney, [who] went head to head against ableist assholes Peter Singer and Jerry Lewis, and wore them in South Carolina." The second recipient was "her friend Laura Hershey in Colorado […] a queer disabled poet and brilliant feminist thinker." Milbern was the third recipient, and the first to document the boots' origins and lineage.

Wearing these boots, "made out of brown leather to look like shoes," so that "wearing them out in public as a wheelchair user is still socially acceptable," is enacting a physical connection to a crip ancestry that would otherwise go unrecognized: "People sometimes assume ancestorship is reserved for those of biological relation, but a queered or cripped understanding of ancestorship holds that, such as in flesh, our deepest relationships are with people we choose to be connected to and honor day after day." For the crip community, maintaining connections to these ancestors, who share with us embodied and felt experiences that our biological family members most often do not share, is an exercise in a continual longing—"All my ancestors know longing. Longing is our connecting place."

[1] "On the Ancestral Plane: Crip Hand Me Downs and the Legacy of Our Movements," *Disability Visability Project*, 10 March 2019, disabilityvisibilityproject.com/2019/03/10/on-the-ancestral-plane-crip-hand-me-downs-and-the-legacy-of-our-movements/.

But as much as longing connects us to our crip ancestry, it can also backfire on us. As a child, I longed for some elder, some close relative, who was like me. I watched *The Miracle Worker* (1962) hoping to find this person in Helen Keller. I watched her onscreen, running around, yelling nonsensically, eating off everyone's breakfast plates. My mother turned to look at me: "I'm so grateful you're not like that," she said. But Helen Keller is still my ancestor. I feel connected to her when I read her work and long for her to say, "don't worry, I found my crip community, too." I also long to read more of Milbern's work, but she died in May of 2020 of complications from surgery. Her last act of social justice was fighting for equal healthcare for disabled people with COVID-19. As her own crip community says, "now Stacey is one of our disabled ancestors."[2]

Milbern herself experienced how longing for crip ancestry, how claiming your crip inheritance, can betray you. Her boots betrayed her: "I loved these boot socks unabashedly, and wore them every day until two years ago, when I slipped in the bathroom at work. I fell because socks, unlike real actual shoes, do not have anti-grip [sic] soles (or soles in general). […] it felt like my ancestors let me down. Like my ancestors didn't 'know better' and it impacted me. It's not fair or reasonable to them, but it's how I felt." This is similar to how I feel when my hearing aids break, when I can't hear on the telephone, when the Facetime connection goes down—my ancestors have betrayed me, and have fallen short of their promise. My inheritance has turned against me. Even though I am one of the many rightful beneficiaries of these technologies, they are still designed to lock us out.

[2] "Loving Stacey Park Milbern: A Remembrance," *Disability Visability Project*, May 2020, disabilityvisibilityproject.com/2020/05/19/loving-stacey-milbern-a-rememberance/.

It took ninety years after Alexander Graham Bell invented the telephone for this technology to become accessible to the d/Deaf community. In the mid 1960s, three d/Deaf engineers, three d/Deaf ancestors, James C. Marsters, Robert H. Weitbrecht, and Andrew Saks, developed the TTY system. Respectively, they invented the teletypewriter (TTY), a device which allowed d/Deaf users to type messages that could be carried over telephone wires; the acoustic telephone coupler, an early modem that connected two TTY devices and two d/Deaf users together; and a telephone relay system, which allowed TTYs to connect to voice users and operators.[3] Harry G. Lang, author of *A Phone of Our Own: The Deaf Insurrection Against Ma Bell*,[4] documents how AT&T, in addition to the U.S. government, actively resisted attempts to integrate fully the TTY system for decades, until the passing of the Americans with Disabilities Act (ADA) in 1990. Lang's Ma Bell is not Mabel Hubbard Bell, the deaf ancestor, the negligent mother of a partially deafened or disabled telephone, but rather the cruel, modern incarnation of the AT&T monopoly. Although the company partially integrated the TTY system as early as 1965, it continued to promote more aggressively its Code-Com system, which relied on the logic of Morse code and Bell's system of Visible Speech in order to "allow the deaf to 'see' messages in coded flashes of light."[5] Although the d/Deaf community, by and large, insisted that for them, "the printed word was the most effective medium,"[6] AT&T persisted in its loyalty to its corporate ancestry, to earlier conceptions about what hearing assistive technology should look

[3] Harry G. Lang provides an in-depth history of the TTY system in *A Phone of Our Own: The Deaf Inssurection Against Ma Bell*, Washington D.C.: Gallaudet University Press, 2000.
[4] I would also argue that this book relies on a masculine narrative of insurrection, where three male, d/Deaf inventors rebel against "Ma Bell." Even as this book reclaims a d/Deaf technological ancestry, it works both consciously and unconsciously to exclude women from this reclaiming. Lang finds three new ancestors in Marsters, Weitbrecht, and Saks, but he obscures the real Ma Bell—Mabel Hubbard Bell.
[5] Lang, 112.
[6] Ibid.

like according to its founder. This ancestral loyalty was the main cause of the frustration that d/Deaf engineers experienced while working on behalf of their communities to create a nationally unified, accessible telephone system.[7]

Indeed, it wasn't until 1993 that "all fifty states had established [TTY compatible] relay systems that operated twenty-four hours a day, seven days a week, with complete confidentiality, no calls rejected, and no restrictions on length of calls or their content."[8] For Lang, this is the moment when the telephone became a fully accessible and possess-able form of technology for the d/Deaf, but he does not take into account how this close tie with an almost exclusively Deaf community inadvertently made the TTY system inaccessible to a related HoH and communication-disabled community. This moment in 1993 was around the same time as I replaced my first, transparent hearing aid with two "flesh-toned," or pale beige, aids. They were supposedly designed to be compatible with landlines and FM systems, but their large size as a result of this design made them almost impossible for a child to wear. I remember the deep frustration and discomfort they caused as I pressed them between my ear and the handheld receiver of our mid-eighties AT&T telephone, which we kept because it worked even when the power went out. It never worked for me, and neither did these ugly, heavy, pale beige hearing aids. Overburdened by their superficial design and their ambition to bridge the gap between flesh and electronics—between my deaf ears and a fundamentally inaccessible form of communication technology—they betrayed me. I longed for better way to speak to my father, who lived across the country from us and who would only call occassionally. No one ever considered the fact that

[7] Ibid.
[8] Ibid, 195.

the TTY system might be more accessible for me, because my disability is socially constructed as HoH and not fully d/Deaf.

The advent of smartphones finally made it possible for me—and many other HoH and d/Deaf people—to participate more fully in telephony. Quite obviously, video calls are more accessible to the d/Deaf because of the visual necessity of sign language and lipreading. As far back as 1957, the d/Deaf community longed for some kind of visual telephone. When AT&T came out with their first video phone, the TV-telephone, *The Silent Worker* photographed a Deaf husband and wife demonstrating the new technology in "Here at Last! The TV-Telephone!" Two side-by-side photographs, with a Deaf woman on the right and her husband on the left, show them signing to each other through two tiny television screens, with two telephones underneath the screens, hanging off the hook. The article says, "how wonderful the device will be when it is finally perfected and put in use, especially for the deaf."[9] Of course, this never happened by design. When video calls finally made it possible for d/Deaf people to communicate with one another, it seemed as if by accident, when in fact it was destiny.

Driving to campus in 2018 with the volume of my car radio turned up high, I heard "Texas Tech […] designing a new app […] making smartphones into hearing aids!" I can never understand the whole story, so I rushed to park and looked up it up on my phone—my phone which is now the nexus of all my technological access, apart from my hearing aids. A hearing father with a HoH son had designed an app so that a smartphone could be effectively turned into a hearing aid with the addition of headphones.[10] The bonus is that this new kind of hearing aid is

[9] "Here at Last! TV-Telephone," *The Silent Worker*, 9.6 January 1957.
[10] Amanda Bowman, "Graduate Student Develops App to Help Son Hear During Water Activities," *Texas Tech Today,* 16 August 2018, today.ttu.edu/posts/2018/08/graduate-student-app.

waterproof—all you need to do is buy a waterproof phone case and earbuds. I was still in the beginning stages of planning this dissertation, and I found it both hilarious and upsetting that the telephone seemed to have finally come full circle, that the hearing aids which became telephones were now hearing aids again. I had a moment where I mourned the lack of acknowledgment of the telephone's deaf ancestry, which only deepens the sense that technology is only meant to cure or erase disability. I wanted to tell this little boy, who gets to go to the pool with his dad and not only hears everything but also doesn't worry about his hearing aids getting wet, that this technology was designed with him in mind from the very beginning. That he is the inheritor of prosthetic technologies that get passed down from d/Deaf person to d/Deaf person, even though we might not even know it.

Bibliography

Allen, Garland E. “The Eugenic Record Office at Cold Springs Harbor, 1910-1940: An Essay on Institutional History.” *Osiris* 2 (1986).

Bauman, H-Dirksen and Joseph Murray. “Reframing: From Hearing Loss to Deaf Gain.” *Deaf Studies Digital Journal* 1 (2009).

Baynton, Douglass. *Forbidden Signs: American Culture and the Campaign Against Sign Language*. Chicago: Chicago University Press, 1996.

Beer, Gillian. “‘Authentic Tidings of Invisible Things’: Vision and the Invisible in the Later Nineteenth Century,” *Vision in Context: Historical and Contemporary Perspectives on Sight*, ed. Teresa Brennan and Martin Jay. New York: Routledge, 1996, 85-98.

---. *Darwin’s Plots Evolutionary Narrative in Darwin, George Eliot, and Nineteenth-Century Fiction*. Cambridge: Cambridge University Press, 1983.

Bell, Alexander Graham. “Growth of the Oral Method of Instructing the Deaf.” 10 November 1894, Horace Mann School, 25th Anniversary Address. Reprinted in *The Annual Report of the Committee on the Horace Mann School*, Boston: Press of Rockwell and Churchill, 1896. http://www.loc.gov/resource/magbell.37600101.

---. Letter to Eliza Symonds. 23 Aug. 1875. MS. Canada, Brantford, Ontario. Library of Congress.

---. “Marriage: An Address to the Deaf,” Literary Society of Kendall Green, Washington, D.C., 1891. Washington, D.C.: Volta Bureau, 1898.

---. “Memoir upon the Formation of a Deaf Variety of the Human Race.” New Haven: National Academy of Sciences. 13 November 1883.

Bell, Eliza Symonds. Letter to Alexander Graham Bell. 4 July Aug. 1875. MS. Canada, Brantford, Ontario. Library of Congress.

Bell, Mabel. Letter to Alexander Graham Bell. 26 July 1876. Letters of Mabel Hubbard Bell, cited in *Mabel Bell: Alexander's Silent Partner*, Lilias M. Toward, Toronto: Methuen, 1984, 31-32.

---. Letter to Gilbert Grosvenor. 11 October 1921. Letters of Mabel Hubbard Bell, cited in *Mabel Bell: Alexander's Silent Partner*, Lilias M. Toward, Toronto: Methuen, 1984, 193.

Bowman, Amanda. "Graduate Student Develops App to Help Son Hear During Water Activities." *Texas Tech Today*, 16 August 2018, today.ttu.edu/posts/2018/08/graduate-student-app.

Boylan, Clare. "'The Secret Diary of Mrs. Rochester': Between Red Rooms and Yellow Wallpapers." *Studi Irlandesi*, 3 (2013).

Brontë, Charlotte. *Jane Eyre*. Ed. Richard J. Dunn. 3rd ed. New York: W.W. Norton and Co, 2001.

Brooks, John. *Telephone: The First Hundred Years*. New York: Harper & Row, 1976.

Brueggemann, Brenda Jo. *Deaf Subjects: Between Identities and Places*. New York: New York University Press, 2009.

---. "On (Almost) Passing." *College English*, 59.6 (1997): 647–660.

Burch, Susan, and Alison Kafer, Eds. *Deaf and Disability Studies: Interdisciplinary Perspectives*. Washington, DC: Gallaudet University Press, 2010.

Congard-Black, Jennifer. *Narrative in the Professional Age: Transatlantic Readings of Harriet Beecher Stowe, George Eliot, and Elizabeth Stuart Phelps*. New York: Routledge, 2004.

Correa, Delia da Sousa. *George Eliot, Music and Victorian*, Basingstoke: Palgrave Macmillan, 2003.

---. "'The music vibrating in her still': Music and Memory in George Eliot's *The Mill on the Floss* and *Daniel Deronda*." *Nineteenth Century Contexts* 21:4 (2000): 541-563.

Crenshaw, Kimberlé. "Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics." *University of Chicago Legal Forum* 1.8 (1989).

Cvetkovich, Ann. *Mixed Feelings: Feminism, Mass Culture, and Victorian Sensationalism*, New Brunswick: Rutgers University Press, 1992.

"Damages for Telephone Girl." *Telephone Magazine*. Ed. John R. Dare. 21 (1903): 113.

David, Deidre. "George Eliot's 'Trump': Recent Work on Harriet Martineau." *Victorian Studies*, 47.1 (2004): 87-94.

Davies, James Q. and Ellen Lockhart, Eds. *Sound Knowledge: Music and Science in London, 1789-1851*. Chicago: Chicago University Press, 2016.

De Land, Fred. *Dumb No Longer: The Romance of the Telephone*. Washington, DC: Volta Bureau, 1908.

Dery, Mark. *Flame Wars: The Discourse of Cyberculture*, Durham: Duke University Press, 1994.

Donaldson, Elizabeth J. "The Corpus of the Madwoman: Toward a Feminist Disability Studies Theory of Embodiment and Mental Illness," *NWSA*, 14.3 (2002).

Duncan, Ian. "George Eliot's Science Fiction." *Representations*, 125.1 (2014): 15–39.

---. *Human Forms: The Novel in the Age of Evolution*. Princeton: Princeton University Press, 2019.

Edwards, R.A.R. *Words Made Flesh: Nineteenth Century Deaf Education and the Growth of Deaf Culture*. New York: New York University Press, 2012.

Eliot, George. *The Mill on the Floss* (1860). Eds. Gordon Haight and Juliette Atkinson. Oxford: Oxford University Press, 2015.

---. "Shadows of the Coming Race," *Impressions of Theophrastus Such*, Ed. Nancy Henry, Iowa City: University of Iowa Press, 1994.

Elizabeth Stuart Phelps: Selected Tales, Essays, and Poems. Ed. Elizabeth Duquette and Cheryl Tevlin. Lincoln: University of Nebraska Press, 2014.

Ellcessor, Elizabeth and Bill Kirkpatrick, Eds. *Disability Media Studies*. New York: New York University Press, 2017.

Ellicott, Elisabeth P. "Telephone Invention had Origin in Inventor's Love for Deaf Girl." *The Washington Post (1923-1954)*, Sep 09, 1935.

Esmail, Jennifer. *Reading Victorian Deafness: Signs and Sounds in Victorian Literature and Culture*. Athens: Ohio University Press, 2013.

Erlman, Veit. *Reason and Resonance: A History of Modern Aurality*. New York: Zone Books, 2014.

Erevelles, Nirmala and Andrea Minear, "Unspeakable Offenses: Untangling Race and Disability in Discourses of Intersectionality." *Journal of Literary & Cultural Disability Studies* 4.2 (2010): 127-143.

Frank, Lucy. "'Bought with a Price': Elizabeth Stuart Phelps and the Commodification of Heaven in Postbellum America." *ESQ: A Journal of the American Renaissance*, 55.2 (2009): 165-192.

Freeman, Janet. “Speech and Silence in *Jane Eyre*,” *Studies in English Literature*, 24.4 (1984): 683-700.

Friedner, Michele and Stefan Helmreich. “Sound Studies Meets Deaf Studies.” *The Auditory Culture Reader*. Eds. Michael Bull and Les Black. London: Bloomsbury Academic, 2016.

Fritsch, Kelly. C. O’Connor, & A. K. Thompson (Eds.), *Keywords for Radicals: The Contested Vocabulary of Late Capitalist Struggle*. Ed. C. O’Connor, & A. K. Thompson. Chico, CA: AK Press, 2016. 23-28.

Gabbard, D. Christopher. “From Custodial Care to Caring Labor: The Discourse of Who Cares in *Jane Eyre*.” *The Madwoman and the Blindman:* Jane Eyre*, Discourse, Disability*. Eds. David Bolt, Julia Miele Rodas, and Elizabeth J. Donaldson. Colombus: Ohio State University Press, 2012, 91-110.

Galvan, Jill. *The Sympathetic Medium: Feminine Channeling, The Occult, and Communication Technologies, 1859–1919*. Ithaca: Cornell University Press, 2010.

Garland-Thomson, Rosemarie. *Extraordinary Bodies: Figuring Physical Disability in American Culture and Culture*. New York: Columbia University Press, 1997.

---. “Eugenic World Building and Disability: The Strange World of Kazuo Ishiguro's *Never Let Me Go*,” *Journal of Medical Humanities*, 38.2 (2007).

---. “Feminist Theory, the Body, and the Disabled Figure,” *The Disability Studies Reader*, Ed. Lennard J. Davis. 2nd ed. Hoboken: Routledge, 2006.

Gilbert, Sandra M. and Susan Gubar, *The Madwoman in the Attic*. New Haven: Yale University Press, 1979.

“Girl at Telephone Died for Others.” *New York Times* 30 Aug. 1908.

Gitelman, Lisa. *Always Already New: Media, History and the Data of Culture*. Cambridge: MIT Press, 2006.

Gezari, Janet. "The Poetry of the Brontës." *The Brontës in Context*, ed. Marianne Thormählen, Cambridge: Cambridge University Press, 2012.

Gorman, Michael E. and W. Bernard Carlson. "Interpreting Invention as a Cognitive Process: The Case of Alexander Graham Bell, Thomas Edison, and the Telephone." *Science, Technology, and Human Values*, 15.2 (1990): 131-164.

Goldmark, Josephine. *Fatigue and Efficiency: A Study in Industry*, New York: Charities Publication Committee, 1912

Gray, Charlotte. *Reluctant Genius: Alexander Graham Bell and the Passion for Invention*. New York: Arcade Pub, 2006.

Green, Venus. *Race on the Line*. Durham: Duke University Press, 2001.

Greenwald, Brian and John Vickrey Van Cleve. "'A Deaf Varity of the Human Race': Historical Memory, Alexander Graham Bell, and Eugenics." *The Journal of the Gilded Age and Progressive Era*, 14 (2015).

Hadjiafxendi, Kyriaki. "Between Deafness and Sound: Aurality and the Limits of Sympathy in George Eliot's The Mill on the Floss." *The George Eliot Review*, 42 (2011): 79-80.

Hamraie, Aimie and Kelly Fritsch. "Crip Technoscience Manifesto." *Catalyst: Feminism, Theory, Technoscience* 5.1 (2019): 1-34.

Haraway, Donna. "A Cyborg Manifesto." *The Cybercultures Reader* Ed. David Bell and Barbara M. Kennedy, London: Routledge, 2000.

Helmholz, Hermann. *On the Sensations of Tone as a Physiological Basis for the Theory of Music* (1875). Trans. Alexander Ellis. London: Longman, Green, and Co., Third Edition, 1895.

"Here at Last! TV-Telephone." *The Silent Worker*, 9.6 January 1957.

Howard, David M. and Jamie A. S. Angus, *Acoustics and Psychoacoustics,* Oxford: Focal Press, 2006.

Isaacson, Walter. *The Innovators: How a Group of Hackers, Geniuses, and Geeks Created the Digital Revolution*. New York: Simon and Schuster, 2014.

Janechek, Jennifer. "*Gendered Information Networks and the Telephone Voice in Shaw's* Pygmalion *and* Village Wooing," *Texas Studies in Literature and Language*, 60.1 (2018): 32-55

Kafer, Alison. *Feminist, Queer, Crip*. Bloomington: Indiana University Press, 2013.

Kahane, Claire. *Passions of the Voice : Hysteria, Narrative, and the Figure of the Speaking Woman, 1850-1915.* Baltimore: Johns Hopkins University Press, 1995.

Kaplan, Carla. "Girl Talk: *Jane Eyre* and the Romance of Women's Narration." *Novel* 30.1 (1996): 5-31.

Keck, Sean. "Literary Regionalism and Mark Twain's Telephone." *The Mark Twain Annual*, 15 (2017): 106-125.

Keller, Helen. *The Story of My Life ; with Supplementary Accounts by Anne Sullivan and John Albert Macy*. Ed. Roger Shattuck with Dorothy Herrmann. 1st ed. New York: Norton, 2003.

Kelly, Lori Duin. *The Life and Works of Elizabeth Stuart Phelps, Victorian Feminist Writer*. Troy, NY: Whitston, 1983.

Kennedy, Meegan. "'A True Prophet'? Speculation in Victorian Sensory Physiology and George Eliot's 'The Lifted Veil.'" *Nineteenth-Century Literature*, 71.3 (2016): 369-403.

Kessler, Carol Farley. *Elizabeth Stuart Phelps*. Boston: Twayne Publishers, 1982.

Kittler, Friedrich. *Discourse Networks 1800/1900*, trans. Michael Metteer and Chris Cullens. Stanford: Stanford University Press, 1990.

---. *Optical Media*, New York: Polity, 2010.

Kreilkamp, Ivan. *Voice and the Victorian Storyteller*. Cambridge: Cambridge University Press, 2005.

Kurlander, Eric. *Hitler's Monsters: A Supernatural History of the Third Reich*. New Haven: Yale University Press, 2017.

Lane, Harlan, Richard C. Pillard and Ulf Hedberg, *The People of the Eye: Deaf Ethnicity and Ancestry*, Oxford: Oxford University Press, 2011.

Lang, Harry G. *A Phone of Our Own: The Deaf Inssurection Against Ma Bell*. Washington D.C.: Gallaudet University Press, 2000.

Leggatt, Judith and Christopher Parks. "From the Red Room to Rochester's Haircut: Mind Control in Jane Eyre." *English Studies in Canada* 32.4 (2006): 169-188.

LeGuin, Ursula. "Learning to Write Science Fiction from Virginia Woolf," *Words Are My Matter: Writings about Life and Books, 2000-2016*, Easthampton: Small Beer Press, 2016.

Long, Lisa A. "'The Corporeity of Heaven': Rehabilitating the Civil War Body in *The Gates Ajar*." *American Literature*, 69.4 (1997): 781-811.

"Loving Stacey Park Milbern: A Remembrance," *Disability Visability Project*, May 2020, disabilityvisibilityproject.com/2020/05/19/loving-stacey-milbern-a-rememberance/.

Mackenzie, Catherine. *Alexander Graham Bell: The Man Who Contracted Space*. New York: Grosset and Dunlap, 1928.

Martin, Michèle. *"Hello, Central?": Gender, Technology, and Culture in the Formation of Telephone Systems*. McGill-Queen's UP, 1991.

Mann, Karen B. "George Eliot and Wordsworth: The Power of Sound and the Power of Mind." *Studies in English Literature, 1500-1900*, 20.4 (1980): 675-694.

McLandburgh, Florence. "The Automaton Ear." *Scribner's Monthly*, 5.6 (1873): 711-721.

McLuhan, Marshall. *Understanding Media: The Extensions of Man*, New York: McGraw Hill, 1964.

McRuer, Robert. *Crip Theory: Cultural Signs of Queerness and Disability*. New York: New York University Press, 2006.

Menke, Richard. *Telegraphic Realism: Victorian Fiction and Other Information Systems*. Stanford: Stanford University Press, 2008.

Middeljans, April. "'Weavers of Speech': Telephone Operators as Defiant Domestics in American Literature and Culture." *Journal of Modern Literature*, 33.3 (2010): 38-63.

Milbern, Stacey. "On the Ancestral Plane: Crip Hand Me Downs and the Legacy of Our Movements," *Disability Visability Project*, 10 March 2019, disabilityvisibilityproject.com/2019/03/10/on-the-ancestral-plane-crip-hand-me-downs-and-the-legacy-of-our-movements/.

Mills, Mara. "Deaf Jam: From Inscription to Reproduction to Information." *Social Text*, 28.1 (2010): 35-58.

---. "Hearing Aids and the History of Electronic Miniaturization," *IEEE Annals of the History of Computing* (2011), 24-44.

---. "On Disability and Cybernetics: Helen Keller, Norbert Wiener, and the Hearing Glove." *Differences: A Journal of Feminist Cultural Studies*, 22.2-3: (2011) 74–111.

---. "When Mobile Communication Technologies Were New," *Endeavour* 33 (2009): 140- 146.

Minich, Julie Avril. “Enabling Whom? Critical Disability Studies Now,” *Lateral* 5.1 (2016).

Mitchell, David and Sharon Synder. *Narrative Prosthesis: Disability and the Dependencies of Discourse*, Ann Arbor: University of Michigan Press, 2000.

Nandrea, Lori. “Desiring Difference: Sympathy and Sensibility in Jane Eyre.” *Novel*, 37.1 (2003): 112- 134.

Paxton, Nancy. *George Eliot and Herbert Spencer: Feminism, Evolutionism, and the Reconstruction of Gender*. Princeton: Princeton University Press, 1991.

Peterson, Linda. “Triangulation, Desire, and Discontent in ‘The Life of Charlotte Brontë.’” *Studies in English Literature, 1500-1900*, 47.4 (2007): 901-920.

Phelps, Elizabeth Stuart. “The Chief Operator,” *Harper’s Monthly Magazine*, July 1909, 300-308.

---. *Three Spiritualist Novels*. Ed. Nina Baym, Urbana: Illinois University Press, 2000.

Picker, John. *Victorian Soundscapes*, Oxford: Oxford University Press, 2003.

Price, Margaret. *Mad At School: Rhetorics of Mental Disability and Academic Life*. Ann Arbor: University of Michigan Press, 2011.

Ronell, Avital. *The Telephone Book*. Lincoln: University of Nebraska Press, 1989.

Sanchez, Rebecca. *Deafening Modernism: Embodied Language and Visual Poetics in American Literature*, New York: NYU Press, 2015.

Sandahl, Carrie. “Queering the Crip or Cripping the Queer?: Intersections of Queer and Crip Identities in Solo Autobiographical Performance.” *GLQ: A Journal of Lesbian and Gay Studies*. 9.1 (2003): 25-56.

Schalk, Sami. *Bodyminds Reimagined: (Dis)ability, Race, and Gender in Black Women’s Speculative Fiction*. Durham: Duke University Press, 2018.

Scholl, Lesa. *Translation, Authorship, and the Victorian Professional Woman: Charlotte Brontë, Harriet Martineau, and George Eliot*. Farnham: Ashgate, 2011.

Shakespeare, William. *Twelfth Night*. In *The Norton Shakespeare* Ed. Stephen Greenblatt, New York: W.W. Norton & Co., 1997.

Shephard, David. "Doctors Afield: Alexander Graham Bell, Doctor of Medicine." *Current Researches*, 53.4 (1974).

Shuttleworth, Sally. *George Eliot and Nineteenth-Century Science: the Make-Believe of a Beginning*. Cambridge: Cambridge University Press, 1984.

Smajić, Srdjan. "Supernatural Realism." *NOVEL*, 42.1 (2009): 1-22.

Snyder, Charles. "Clarence John Blake and Alexander Graham Bell: Otology and the Telephone." *Annals of Otology, Rhinology, and Laryngology* 83:4 (1974).

Solow, Sharon Neumann. *Reading Between the Signs: Intercultural Communication for Sign Language Interpreters*. Boston: Intercultural Press, 2014.

Spivak, Gayatri Chakravorty. "Three Women's Texts and a Critique of Imperialism." *Critical Inquiry*, 12.1 (1985): 243–261.

Spring, Elizabeth T. "Elizabeth Stuart Phelps." *Our Famous Women: An Authorised Record of their Lives and Deeds*. Hardford: A.D. Worthington, 1883, 60-79.

Sterne, Jonathan. *The Audible Past: Cultural Origins of Sound Reproduction*. Durham: Duke University Press, 2003.

Stuart, Elizabeth. "Elizabeth Stuart Phelps: A Good Feminist Woman Doing Bad Theology?" *Feminist Theology*, 9.26 (2001): 70-82.

Toward, Lilias M. *Mabel Bell: Alexander's Silent Partner*. Toronto: Methuen, 1984.

Tressler, Beth. "Illegible Minds: Charlotte Brontë's Early Writings and the Psychology of Moral Management in Jane Eyre and Villette," *Studies in the Novel*, 47.1 (2015).

Weinstein, Cindy. "Heaven's Tense: Narration in *The Gates Ajar*." *Novel: A Forum on Fiction*, 45.1 (2012): 56-70.

Wendell, Susan. "Toward a Feminist Theory of Disability," *The Disability Studies Reader*, Ed. Lennard J Davis. 2nd ed. Hoboken: Routledge, 2006.

"Weavers of Speech."*American Telephone and Telegraph*. Advertisement. Dec.1915. Box 2061, AT&T Archives.

Wettlaufer, Alex. *Portraits of the Artist as a Young Woman: Painting and the Novel in France and Britain, 1800-1860*. Columbus: Ohio State University Press, 2011.

Wing, George. "The Associative Feature in the Education of the Deaf" (1886). *Deaf World: A Historical Reader and Primary Sourcebook*. Ed. Louis Bragg. New York: New York University Press, 2001, 165-174.

Womack, Ytasha. *Afrofuturism: The World of Black Sci-Fi and Fantasy Culture*, Chicago: Lawrence Hill Books, 2013.